PAPER TRADE JOURNAL

OCTOBER 26, 1944

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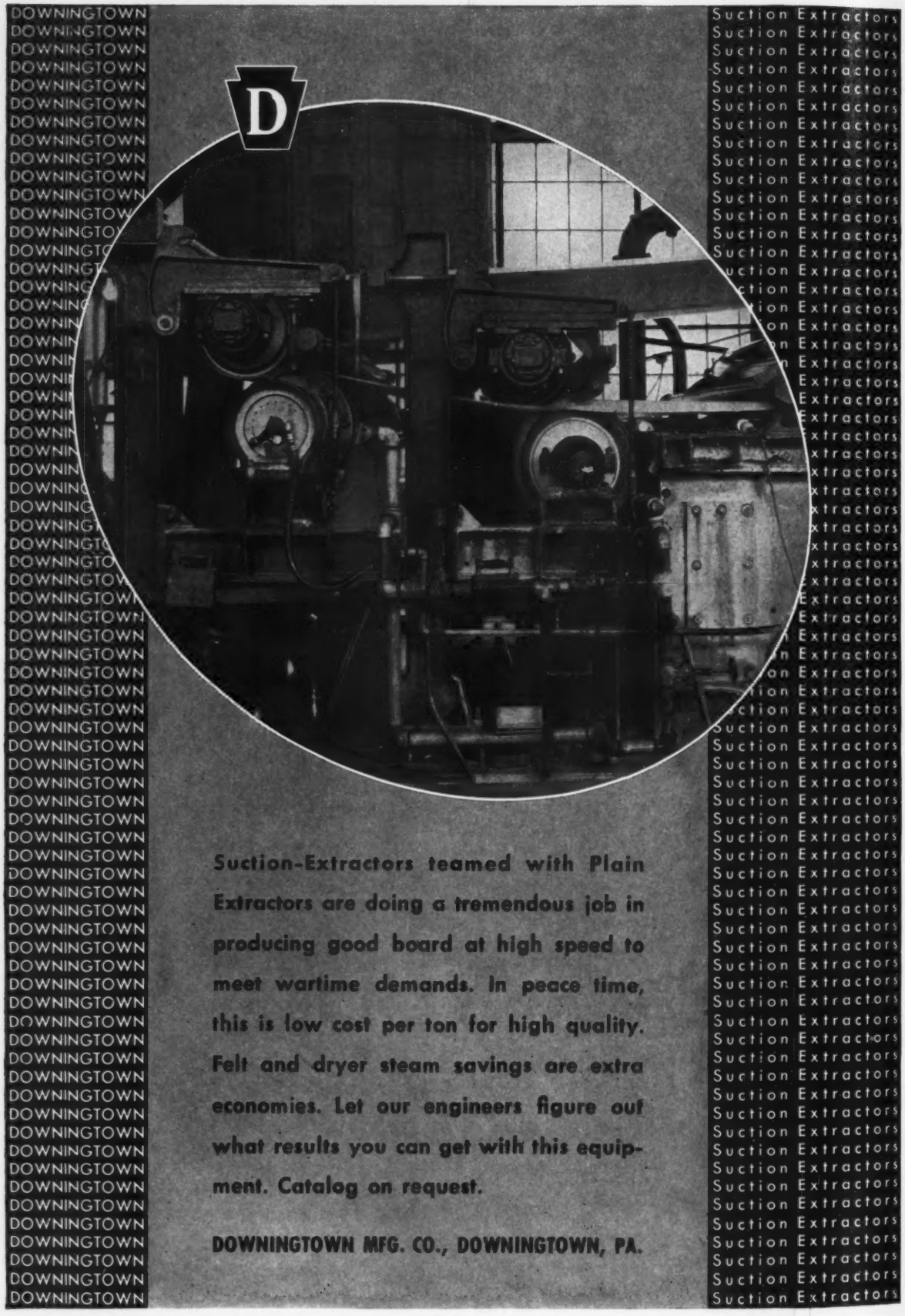

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DEFINITION: The uniformity of a lubricant is generally understood to mean the conformity in certain specified essential qualities between two or more separate "lots", "batches", or drums of lubricant.

EXPLANATION: In general a slight variation between drums of lubricant in one or more qualities —carbon residue, pour point, specific gravity, etc.—may not have any noticeable effect on the performance of the lubricant. However, if there is a variation in more than one quality—or if the variation occurs in a quality that has a critical bearing on a specific service for which the lubricant is used (i.e., Demulsibility of Steam Cylinder Oils)—then a serious variation in lubricant performance is likely to result.

TEST: There is no single test that can be made to determine uniformity. In practice, each "batch" of lubricant must conform to certain prescribed test limits. The lubricant is tested for certain specific qualities, depending on the service in which it is to be used. Tests may be made for Viscosity, Flash Point, Carbon Residue, Pour Point, Neutralization Number, Penetration, Specific Gravity, Color, or any other pertinent factors.

CONCLUSION: Most reputable refiners and marketers of lubricating oils, greases, and compounds recognize the extreme importance of maintaining uniformity. For this reason their entire manufacturing and testing procedure is scientifically conducted and strictly controlled. Regular testing by skilled technicians, using modern test equipment, provides a further means of assuring the continuing uniformity of each specific lubricant.

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Vol. 119, No. 17

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

October 26, 1944

Technical Association Meets At Savannah

TAPPI Alkaline Pulping Committee Sponsors Meeting Which Is Well Attended By Representatives of Southern Sulphate Mills — Vertrees Young Suggests Meeting Next Year At New Orleans.

About 150 members of the Technical Association of the Pulp and Paper Industry met at the De Soto Hotel in Savannah, Ga., on October 18-20 inclusive. The meeting was sponsored by the TAPPI Alkaline Pulping Committee and the Byproducts Committee and was attended principally by representatives of the sulphate pulp and paper mills in the Southern States.

The meeting was opened by G. W. E. Nicholson, resident manager of the Union Bag and Paper Corporation and vice president of the Technical Association who introduced Kirk Sutlive who was chairman of the local arrangements committee. K. G. Chesley, chairman of the Alkaline Pulping Committee was next introduced and proceeded with the regular program.

Chip Size and Hardwoods

Neil F. Robertson of the Crossett Lumber Company was the first speaker and presented a paper on "Factors Influencing Optimum Chip Size." Reporting on tests made the speaker found that under the cooking conditions he used, the maximum screened yield was obtained from the smaller chips. The test results also showed that the permanganate number is not a fully satisfactory test in the higher ranges for determining the degree of pulping. The screened yield is increased in proportion to the increase of permanaganate number of all chip sizes.

R. T. Hudson, chemical engineer for the Union Bag and Paper Corporation, Savannah, read a paper on "The Effect of Chip Size on Pulp Yield." He found that over the range of cooking degree studied it was found that the total average yield increased from 42.5 to 50% over a permanganate number range of 23 to 35 and that under the same cooking conditions total yields were progressively higher with larger chips.

Mark W. Bray of the Forest Products Laboratory, Madison, Wis., discussed "Hardwood Pulping." He indicated that of the more than 100 million acres of woods located in Southern States about 51% are hardwoods, furthermore, as pine land is cut over, the new tree crops are generally hardwoods. There appear to be no hardwoods that cannot be pulped with relative ease. The use of high yield methods to obtain hardwood pulps for blends and boards was recommended.

Digester Operating Symposium

Mr. Chesley opened the afternoon session by asking all present to give their name and company connection. Nearly every mill in the South was represented.

E. A. Harper of the Brunswick Pulp and Paper Company discussed Direct vs. Indirect Cooking. This paper presented actual mill results over a period of six months for each type of cooking. Mr. Harper indicated that in producing sulphate pulps of high quality and high brightness indirect cooking should be considered. The steam applied to digester heaters should be desuperheated. Steam with superheat has a tendency to carbonize the liquor on the heater tubes. This decreases the overall heat transfer, which increases the total heat consumption per cook. There appears to be a slight increase in digester yield in the case of direct heating. This may be attributed to the fact that a greater number of direct cooks blow clean.

E. H. Hill of the North Carolina Pulp Company read a paper on "Alkaline Pulping With and Without Pump Circulation." Among his findings were the following: Charging the digesters with insufficient volume of liquor resulted in differences in the permanganate numbers of the pulp in different sections of the digesters when no forced circulation was used; with forced circulation, this condition was corrected. Forced circulation gave a slightly softer pulp than when cooked under the same conditions without forced circulation. Forced circulation produced a uniform pulp throughout the digester at a lower volume of liquor and thereby provides a saving in total steam used for cooking. Forced circulation has advantages. Whether or not it is necessary depends on many factors that must be analyzed for each mill, but it is doubtful if forced circulation is as important as some claim it to be.

H. O. Ehrisman of the Foxboro Company, Foxboro, Mass., discussed "Automatic Digester Control." In this paper Mr. Ehrisman described the applications of a new electronic device that is extremely sensitive to temperature changes and can make simultaneous readings in various parts of the digester.

Byproducts Session

On Thursday morning both committees met in joint session with R. H. Stevens of the National Container Corporation presiding as chairman.

Harry F. Lewis of the Institute of Paper Chemistry talked on "The Recovery of Chemical Byproducts from Kraft Black Liquors by the Goodell Process." The Goodell Process involves the separate drying of the black liquor, destructive distillation of the black liquor solids, use of the noncondensible gases as a source of heat, separation of the aqueous distillate and tar and then of the tar into phenolic oils and neutral compounds. The phenolic oils contain phenol,

(Continued on page 22)

Seek To Persuade Labor to Cut Pulpwood

War Manpower Commission and Wisconsin Office Will Cooperate To Put More Farm Workers Into Forest Work This Season — Approves Waste Liquor Research — Create Forestry Scholarships.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 23, 1944—The War Manpower Commission and state headquarters of selective service at Madison, Wis., are trying to induce agricultural workers to go to northern Wisconsin forest tracts to cut pulpwood during the winter months of 1944 and early 1945.

"Enormous increase in amounts of pulpwood and paper pulp as well as lumber products to be used as materials to manufacture and ship munitions, tractors, tanks, guns, and airplane parts to the war fronts requires that thousands of workers will be needed in the northern woods to get out this necessary war material," William E. O'Brien, state director of WMC, declared last week.

He explained that the use of pulpwood and paper pulp in the manufacture of gunpowder and dynamite alone requires thousands of cords of pulpwood and tons of pulp and is a heavy drain on supplies now at hand.

H. H. Smith, in charge of the rural industries division, stated that arrangements completed between the WMC and selective service provide that farm workers between the ages of 18 and 37 will be permitted to work the four winter months in essential industry without altering their draft classification. Those not needed on the farm during the coming months will contact their draft boards for their release, if they are willing to help the war effort by cutting pulpwood. They will then go to the nearest United States Employment Service offices for assignment to work.

Mr. O'Brien and Mr. Smith both pointed out that farm workers volunteering for this emergency work will be doing a highly patriotic service to the war effort, and the war can be shortened materially by an adequate response.

It was emphasized, however, that only those workers who can be spared from the farms on which they are presently employed will be considered for woods work during the off-season.

There has been little pulpwood shipping during the summer months, but logging operations have been in progress. Increased railroad car loadings and trucking from wooded areas are becoming apparent, as accumulated pulpwood that has been cut since last spring is starting on its way to various mills.

Announces School Scholarships in Forestry

Seniors in 29 high schools in the Wisconsin river valley are eligible to compete for five $500 scholarships in forestry, under a plan announced last week by Folke Becker, Rhinelander, Wis., as president of Trees for Tomrrow, Inc. Mr. Becker is president of the Rhinelander Paper Company.

"These scholarships are inaugurated to heighten interest in conservation and to help high school graduates who show an aptitude and earnest desire to make forestry their profession," Mr. Becker said. The scholarships are to be awarded by local committees on a point basis.

The state department of public instruction at Madison, Wis., has divided participating schools into five districts, according to M. N. Taylor, executive director of Trees for Tomorrow. One scholarship will be awarded annually in each district.

Among the schools in District 1 are Rhinelander and Tomahawk; Mosinee is in District 2, along with others; Wausau alone constitutes District 3; Stevens Point, Port Edwards and Nekoosa are in District 4, and Wisconsin Rapids is in District 5.

D. C. Everest, president and general manager of the Marathon Corporation, and a member of the board of Trees for Tomorrow, is a member of the committee in District 3; N. S. Stone, Mosinee, vice president and general manager of Mosinee Paper Mills Company, and also a member of the board of Trees for Tomorrow, is on the committee of District 2, and A. J. Schierl, secretary of Whiting-Plover Paper Company, and a member of the Trees board, is a member of the District 5 committee.

A folder distributed to the high schools in the five districts explains the plan in detail and contains articles on the importance of the school forests, how credits can be earned toward a scholarship award, on forestry as a career and a bibliography of helpful reading.

Among other members of the board of Trees for Tomorrow is Harold C. Collins, president of the Wausau Paper Mills Company, Brokaw, Wis.

Thilmany Mill Wins Safety Contest

Thilmany Pulp and Paper Company's bag mill at Kaukauna, Wis., has won the National Safety Council contest in the paper and board re-manufacturing group with a perfect record, it was announced last week.

The contest was for the period from July 1, 1943, through June 30, 1944, and included 37 mills throughout the United States. The Thilmany bag mill averages about 110 employes and the last lost-time accident occurred on April 26, 1940.

A plaque was awarded by the National Safety Council during the congress held October 3, 4 and 5 in Chicago. This is the third consecutive year the bag mill has won a trophy with a perfect record.

The Thilmany truck drivers who were enrolled in the National Fleet Safety contest also finished the year with a perfect record. These drivers were eligible for safe driving awards from the Employers Mutuals Insurance Company. Recognition of the honors these units have earned will be given by the Thilmany Pulp and Paper Company at a dinner and program which will be given soon.

Approves Waste Liquor Research

Establishment of an industrial research fellowship at the University of Wisconsin to study the fermentation of waste sulphite liquor from paper mills to determine the possibility of its profitable use has been approved by the University of Wisconsin Board of Regents.

The Rhinelander Paper Company, Rhinelander,

Wis., gave the university $3,300 to finance the research in the department of biochemistry and agricultural bacteriology.

Its purpose will be in investigate the possibility of manufacturing lictic acid, butyl alcohol or other useful chemicals from the waste sulphite liquor of paper mills.

Col. Mulzer Receives Merit Award

Col. Leslie G. Mulzer, who lived 15 years ago at Port Edwards, Wis., where he was pilot for the Nekoosa-Edwards Paper Company's tri-motored plane which carried jobbers to and from Chicago, has been awarded the Legion of Merit for outstanding leadership and devotion to duty in the processing of bombers at the AAF 62nd sub-depot, Mac Dill Field, Florida.

Colonel Mulzer, recently made commanding officer of the Oklahoma City Air Service Command, received the decoration for his work as engineering officer of the Tampa sub-depot during the period from January 1 to March 31, 1942.

Names Chairmen of Safety Meetings

Chairmen for the two general safety meetings of the Twin City Safety Council have been named by Howard H. Aderhold, general chairman. R. M. Sensenbrenner will act as chairman for the first meeting to be held in Menasha February 6, 1945, and Don Severson will be chairman for the Neenah meeting on March 27, 1945.

Sets New Pulpwood Prices in South

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 23, 1944—Two changes in the regulation establishing ceiling prices for pulpwood produced in seven States in the southeastern area were announced by the Office of Price Administration today.

Effective October 23, 1944, the changes are:

1. A new ceiling price of $10.10 per cord f.o.b. freight cars is established for Select Rough Black Gum pulpwood, when sold for shipment to Hartsville, S. C. for use there in the manufacture of semi-chemical pulp.

2. The differential over the f.o.b. car price for pulpwood delivered by truck to a consumer's mill in Tuscaloosa, Ala., is established at $2 per cord, instead of $1.25 as heretofore.

The seven States covered by this pulpwood regulation are South Carolina, Georgia, Florida, Tennessee, Mississippi, Alabama, and Louisiana east of the Mississippi River.

Superintendents Meet at Glens Falls

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., October 24, 1944—The first fall meeting of the American Pulp and Paper Mill Superintendents' Association was held here last week at the Queensbury with many members present. The principal speaker was J. Westergaard, of Castle & Overton, Inc., who is considered an outstanding authority on the foreign pulp situation. He discussed the present and postwar pulp outlook. A round table discussion was also held and through the courtesy of the Sandy Hill Iron and Brass Works an interesting motion picture was shown. Reservations for the affair were under the supervision of Laurence P. Thompson, of the Marinette Paper Company, this city.

Plan Post-War Modernization

The Peerless Paper Mills Inc., manufacturers of toilet paper, paper towels, and paper specialties, Oaks, Montgomery County, Pa. have recently acquired a three acre tract of land at the junction of the Reading and Pennsylvania Railroads across the Railroad from the present mill, for the purpose of future expansion, including the construction of drainage basins, etc.

Installation has already begun of a modern water-softener system, to insure an adequate supply of properly treated artesian well water for the production of the sanitary tissue needed for converting into the company's product of roll toilet paper.

The post-war plans of this company include the installation of modern automatic wrapping machines for the labeling of the product and a conveyor system for handling the cartons of finished products as they come off the roll converting machines. Expansion of the present line of industrial type paper towels is proposed, along with the installation of converting equipment for the production of the two-ply facial type roll toilet paper.

The Peerless Paper Mills was organized in 1923 by Lewis I. Rossiter, Albert P. Wilson and Isaac J. Sheppard, who together with Nelson Easton and Fred Cage are the present officers of the organization; at that time taking over the business of the Peerless Manufacturing Company, which was started in Philadelphia in 1898 by J. Cloude Smith of Norristown, Pa.

74 Years in Paper Industry

On September 15, S. A. Shannon of Boston, Mass. rounded out 74 years of consecutive service in the paper industry. He celebrated his 90th birthday last June 18, and it would be interesting to ascertain how many men there are in the industry today who can equal or exceed his record either in age or continued service.

On September 15, 1870, Mr. Shannon entered the employ of Rice, Kendall & Co. of Boston as an errand boy and served with them for a number of years, finally landing in the sales end of the business. In 1885 he severed this connection and formed a sales organization of his own, in which he continued until at the suggestion of Garrett Schenck, then president of the Rumford Falls Paper Company, he entered its employ as a sales manager covering the territory betwen Boston and Washington, D. C. This connction lasted until the formation of the International Paper Company when he again entered business on his own account in New York as a mill representative handling a diversified line of paper products. In 1928 he transferred his activities to Boston where he still continues in business.

Herbert Heesch Joins Hooker Co.

The Hooker Electrochemical Company, Niagara Falls, N. Y., announces the appointment of Herbert Heesch to its sales staff in the northern New Jersey area. Mr. Heesch was graduated from the University of Rochester as a Chemical Engineer in 1932. He first joined the Hooker sales staff in 1933, serving the eastern states until 1937. Prior to his recent appointment, he was a salesman with the Heyden Chemical Corporation. His varied experience in the chemical field will be a valuable asset to the users of Hooker chemicals in his territory.

SURPLUS G. I. MATTRESSES

Now Available

for Cotton Content Paper

HERE is a welcome, if temporary, source of additional first-class cotton fiber for paper making.

The white virgin cotton and high-grade cotton linter fillers in the surplus government mattresses now coming from dismantled military camps make an exceptionally fine paper. And a large tonnage of the mattresses is already moving to paper mills.

To help RAYCO customers meet their fiber requirements, we are glad to be able to offer these mattresses for forward commitments. While the mattresses are made of different combinations, they will average 50% cotton and 50% linters. The different mixes as delivered are all comparable in fiber content for use in paper making. Approximately 1000 whole mattresses are stacked in each car.

RAYCO technicians will give purchasers of these mattresses the same chemical engineering and technical service as on RAYCO Linter Cotton, and will also assist in developing the best mechanical handling of the mattresses.

We can accept forward commitments on these mattresses, but can give no assurance as to how long the supply will last. So we advise that you check your requirements, and get in touch with us as early as possible.

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and Everywhere

TECHNICAL ASSOCIATION MEETS AT SAVANNAH

(Continued from page 17)

guaiacol, ortho and paracresol, creasol, and the high phenols. The complete separation and purification of these lower constituents is not easy because of the pressure in the crude phenolic oil of many substances which condense readily with phenolic compounds. Two hundred and fifty tons of tar per ton of pulp are produced and up to 60 lbs of phenols boiling up to 220° C.

S. G. Norton of the Hercules Powder Company, Brunswick, Ga., discussed "The Use of Sulphate Turpentine as a Chemical Raw Material." Pinenes are terpenes found principally in turpentine. They are very reactive and capable of being converted into a long list of terpene compounds of considerable commercial value.

Mark W. Bray gave a Review of Some of the Work the Forest Products Laboratory is doing on Lignin, including the preparation of paper base plastics.

Arthur W. Pollak of the West Virginia Pulp and Paper Company, Charleston, S. C., described "Products Other than Pulp and Paper Manufactured or Potentially Available from the Wood Pulp Industry."

T. K. Hasselstrom of the G. & A. Laboratories, Savannah, talked on "What Practical Lines Should Be Followed as to Fundamental Research on Sulphate Pulp Byproducts." Dr. Hasselstrom recommended that fundamental research be carried on relative to tall oil, lignin, methanol, turpentine, etc.

Ralph H. McKee of New York City outlined "The Industrial Uses of Tall Oil Marketing Problems." In this paper Dr. McKee outlined the needs of soap, varnish, paint, metallic drier, textile oil, cutting oil, lubrication grease, disinfectants, soluble oils and synthetic resin industries for product derived from tall oil.

Sulphidity in Sulphate Pulping

Otto Kress, Technical Director of the Institute of Paper Chemistry presented a paper on the "Development of High Sulphidity in Kraft Cooking Liquors." Although salt cake is the important makeup chemical in the kraft process, many mills, in order to increase sulphidity, are adding sulphur to the extent of from 12 to 50 lbs. per ton of pulp, the points of addition being direct to the furnace, in admixture with concentrated black liquor which is sprayed into the furnace, or by adding the sulphur either to the green or white liquor or directly to the digester.

Dr. Kress reported on the following experiments: 1. Soda base sulphite pulping of Southern woods and the utilization of the resulting waste liquor as a source of replacement chemical in kraft pulping. 2. The effect of adding sulphur in the form of sodium sulphite to caustic soda in the cooking of kraft pulp. 3. The effect of adding sulphur to white liquor. 4. Study of the reaction of sodium thiosulphate with sodium hydroxid in the absence of wood. 5. The direct addition of sulphur to smelt produced in the kraft recovery furnace. 6. Raising the sulphidity of smelt by the addition of sulphur dioxide to the smelter.

Vernon L. Woodside of the Mathieson Alkali Company gave a preliminary report on "The Addition of Synthetic Salt Cake to Green Liquor." Synthetic salt cake, an intimate fusion of sulphur and soda ash in proper molecular proportions may be added to the dissolver tank. About 0.321 lb. of this material may be added to each gallon of green liquor. Several economies were cited.

M. L. Taylor of the Union Bag & Paper Corporation showed the "Results of Questionnaire on Materials of Construction Used in Tall Oil Plants."

Alkaline Pulping Round Table

Among the subjects discussed in the general Alkaline Pulping Round Table were the following: "Purchase of Wood by Weight vs. Volume"; "Determining Pulp Yields" and "Utilization of Waste."

E. C. Jahn, Banquet Speaker

Edwin C. Jahn, Professor of Wood Chemistry at the New York State College of Forestry, Syracuse, N. Y. was the principal speaker at the banquet. Professor Jahn reported on "The Wartime Picture of the Swedish Pulp and Paper Industry." In this talk Dr. Jahn gave in considerable detail the developments that he noted in Sweden and Finland during his recent sojourn of the past year or more. Although much of Dr. Jahn's talk was off the record, his address as well as most of the papers mentioned in this meeting report will be published later.

R. G. Macdonald, Secretary of TAPPI gave a number of reminiscences of previous meetings of TAPPI in Savannah and commended the local committeemen on the success of this meeting.

As a result of the meeting's value, Vertrees Young, vice president of the Gaylord Container Corporation invited the association to hold a meeting of a similar nature at New Orleans next spring.

Plant Visits

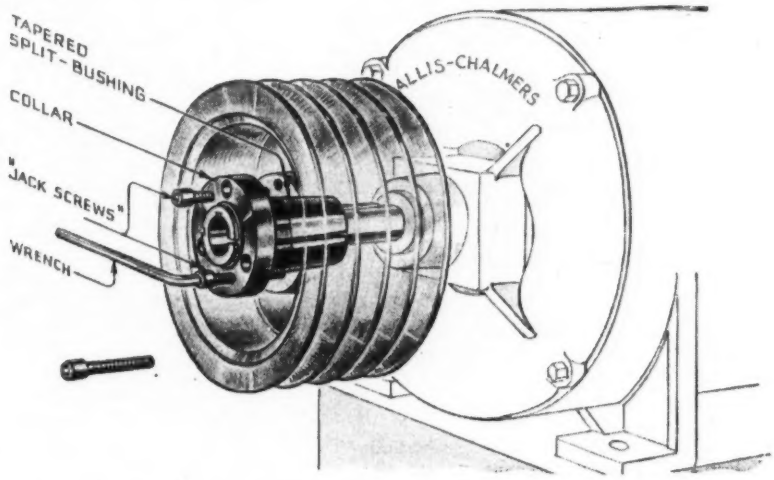
The weather during the meeting was sensationally marked by a tropical hurricane that struck Savannah and the Coastal Plain, causing much damage. In spite of this, through considerable effort the mill of the Union Bag & Paper Corporation was put in good operating condition during the night to enable those present to visit the plant on Friday morning. Following a luncheon as guests of the Union Bag and Paper Corporation the group visited the famous Herty Laboratory where cotton stems were being manufactured into nine point board.

Those Present

Those present included: Eric A. Anderson, R. D. Arnsbury, E. O. Barnes, John Beaujean, Richard Bender, C. E. Bannerman, H. G. Bickley, M. W. Bray, E. A. Brennan, W. J. Brown, R. G. Butler, J. B. Calkin, H. D. Camp, W. B. Campbell, W. L. Campbell, R. F. Clemens, W. C. Chapman, J. B. Chandler, H. Y. Charbonnier, K. G. Chesley, T. A. Cook, K. W. Coons, R. D. Cowherd, R. A. Diehm, T. T. Dunn, C. D. Dougherty, V. P. Edwardes, H. O. Ehrisman, J. P. Ekberg, Edw. Engel, W. Z. Friend, W. S. Furnas, R. R. Fuller, C. C. Gouldman, W. F. Gillespie, A. E. Griffin, Carl M. Guest, P. J. Hannan, E. A. Harper, M. R. Hammarot, H. B. Harris, C. E. Hartford, Torsten Hasselstrom, F. Heyward, M. E. Hazen, C. S. Hill, E. H. Hill, R. P. Hill, D. C. Holland, D. A. Huber, R. T. Hudson, G. E. Jackson, E. C. Jahn, T. C. Johnson, W. H. Jennings, Douglas Jones, F. L. Jones, F. W. Kelley, V. E. Kirby, E. D. Krebs, Maurice Klein, Otto Kress, D. B. Kuhe,

X-Ray View

OF ALLIS-CHALMERS' NEW "MAGIC-GRIP" SHEAVE



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1 **Remove three capscrews** from bushing collar. A handy wrench — supplied with each sheave — is the only tool needed to remove Allis-Chalmers' new "Magic-Grip" from motor or machine shaft quickly and easily.

2 **Insert two capscrews** in tapped holes. As screws are turned, they become levers . . . automatically breaking tight grip of tapered split bushing on sheave and shaft. Entire unit is then ready for removal.

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V. Failmezger to Be Sales Manager

H. K. Porter Company, Inc. of Pittsburgh, Pa., has appointed Victor Failmezger, previously application and field engineer for the company, to the position of sales manager of its subsidiary, Quimby Pump Company, of Newark and New Brunswick, N. J.

Expansion of Quimby pump facilities for the chemical and oil fields, and in special application, will be an important phase of an extensive sales program planned by Quimby, under Mr. Failmezger's direction, W. W. Calihan, Director of Sales for Porter and Subsidiaries, said in making the announcement.

During the past year, Mr. Failmezger has represented Porter and its subsidiaries in Western Pennsylvania, West Virginia, and Eastern Ohio.

Mr. Failmezger is a graduate of Stevens Institute of Technology with degree of Mechanical Engineer. He was associated with Westinghouse Electric and Manufacturing Company, and Worthington Pump Company in both sales and application engineering in the 15 years prior to joining the Porter organization.

Purchases Emeryville Chemical Co.

The Diamond Alkali Company, Pittsburgh, Pa., has purchased the Emeryville Chemical Company, 405 Montgomery street, San Francisco, Cal. The manufacture of silicate of soda, sodium metasilicate, and silicate compounds will be continued at the plant which is located at 1269 - 66th street, Emeryville, Cal.

Stanley Pedder and Charles Eckland will continue in their present capacities as president and vice president of the company, and no changes in personnel are contemplated except that Howard R. Bauer will be transferred from the Diamond Alkali organization to San Francisco to serve as general manager of the Emeryville Chemical Company.

The Standard Silicate Division of the Diamond Alkali Company operates silicate of soda manufacturing plants located at Cincinnati, Ohio, Jersey City, New Jersey and Marseilles, Ill. Silicate of soda is also produced by Standard Silicate Corporation at Lockport, N. Y., and the Diamond Alkali Company of Texas, Dallas, Tex. Sodium metasilicate and silicate compounds are made at the Cincinnati and Jersey City plants.

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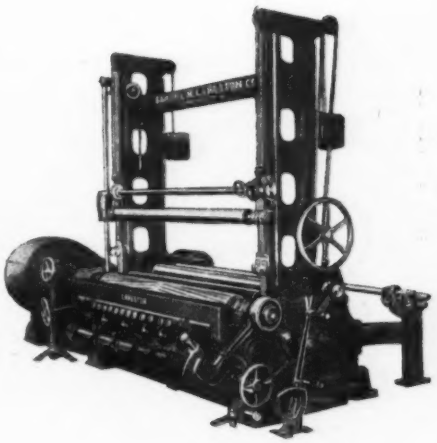

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Superintendents Meet at Kalamazoo

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., October 24, 1944—The Michigan Division of The Paper Mill Superintendents held their October meeting at the Park American Hotel Thursday evening of last week. The new officers presided and chairman Joe Waber announced his committee appointments for the current year. Albert Wilson, editor of the *Pacific Pulp and Paper Industry*, published in Seattle, Wash., was a guest of the association and gave a brief talk.

The speaker was R. W. Polleys, sales engineer for Shartle Brothers Machine Company. At the beginning of his talk he commented on the fact that his company being engaged 100% in defense work the past three years, was somewhat out of touch with the industry, but now that only about 25% of its capacity was on war contracts, it hoped to resume its former schedules. His address consisted of a detailed description of the unit used in the Shartle system of stock preparation. His expert knowledge of this product and the explanation of its operation made an interesting and instructive address. His prediction regarding new developments was that they would be slow in coming but many improvements on present equipment were being worked out and would be rapidly introduced.

Two new members of the Division, J. W. Brown and T. R. Fielding of the North American Pulp and Paper Company, were introduced.

Those in Attendance

The following were included among those in attendance at the meeting:

W. H. Astle, J. A. Dean, A. E. Haip and Ray L. Barton, Michigan Paper Company; Ralph Atkins, Lee Paper Company; J. W. Brown and T. R. Fielding, North American Pulp and Paper Company; F. L. Chappell, A. G. Dreis, A. R. Klosterman and H. O. Ware, Hercules Powder Company; A. A. Coffin, Titanium Pigment Corporation; A. W. Cole and Joe Waber, Rex Paper Company; F. B. Eilers, Orr Felts and Eastwood Nealy Wire Company; L. E. Fitzgerald; Frederick Franz and H. E. Nelson, French Paper Company; G. E. Graham, R. A. Lane, Al Sherwood and Arnold Weller, Sutherland Paper Company; W. F. Hathaway, L. H. LaLiberte and R. B. Stewart, Kalamazoo Vegetable Parchment Company; Carl Goelderle, Anheuser Busch, Inc.; C. A. Johnson, Saniwax Paper Company; Mr. Kircher, American Cyanamid and Chemical Corporation; J. H. Kniffin, Metrol Company; Walter Moore, Corn Products Company; R. W. Rolleys, Shartle Brothers Machine Company; C. Baldy Smith; R. W. Shew and R. J. Suess, Otsego Falls Paper Company; W. E. Shaw, E. D. Jones & Sons Company; J. Scheuermann, Cameron Machine Company, C. A. Weston, E. J. Kelly Ink Company; A. E. Woollam, Gould Pumps; Harry Williamson, Western Board and Paper Company; M. R. Wilking and L. A. Willoughby, Bryant Paper Company, and Albert Wilson, *Pacific Pulp and Paper Industry*.

Issues New Ruling on Paper and Board

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 23, 1944—Manufacturer of paper and paper board are required to hold in reserve for future distribution, on order of the War Production Board, 35% of their total production of groundwood, printing, book writing and coarse wrapping paper, WPB said today.

Under an amendment to Conservation Order M-241 just issued, reserve production of condenser tissue and sanitary food container stock remains at 100% of production, but with the reclassification of groundwood, printing and the papers mentioned above, reserves of all other paper and paper board controlled by M-241 were reduced to 20% of production, WPB Paper Division officials said. The reserve requirement for all these papers and paper boards except condenser tissue and sanitary food container stock was 35%.

Certain types of paper board are not controlled by Order M-241, it was pointed out, but are subject to the following specific Conservation Orders; Container Board, M-290; Paper Board, M-378; and Building Boards, Asbestos and Asbestos Filled Paper, M-79.

Mill and consumer paper and paper board inventories are now restricted to thirty tons or thirty days' supply, whichever is greater, instead of the indefinite two carloads formerly the inventory ceiling. Inventories of folding and set-up box manufacturers, however, are fixed at a maximum of forty tons or 60 days' supply, based upon their average consumption rate during the latest three-month period.

Another amendment requires that certificates be filed with purchase order under Limitation Orders M-241-a, Converted Paper Products; L-241, Commercial Printing; L-244, Magazine and Periodicals; L-245, Books and Booklets; L-289, Greeting and Illustrated Post Cards; L-294, Displays; L-350, Governmental Commercial Printing and Duplicating; and L-177, Wallpaper, together with statements that the paper ordered is for the indicated use under the specific order or to replace inventory paper actually used under the order.

Newspapers Use Less Newsprint

For the fourteenth consecutive month daily newspapers have reduced their consumption of newsprint paper as compared with the same month of the previous year.

Daily newspapers reporting to the American Newspaper Publishers Association consumed 189,612 tons of newsprint paper in September 1944 compared with 222,718 tons in 1943 and 239,098 tons in 1941. This was a decrease in September 1944 under September 1943 of 14.9% and a decrease under September 1941 of 20.7%. The year 1941 is the base for calculating allowable use by newspapers.

The total estimated newsprint consumption in the United States for September 1944 was 252,816 tons which includes all kinds of uses of newsprint paper. For the first nine months of 1944, it was estimated to be 2,287,247 tons.

During the first nine months of 1944 the reporting newspapers used 1,715,435 tons of newsprint, a decrease of 16.1% under the first nine months of 1943, and a decrease of 20.1% under the first nine months of 1941.

The stocks of newsprint paper on hand with newspapers reporting to the ANPA was 63 days' supply of 3 days' supply from 66 days on hand at the end at the end of September 1944, which was a decrease of August 1944.

Instrumentation Studies XLVIII*

A Study of Instruments for the Measurement of Opacity of Paper

Part II. Calibration of the Bausch and Lomb Opacimeter

By the Staff of The Institute of Paper Chemistry

Introduction

The purpose of this report is to describe a means for calibrating and checking the Bausch and Lomb opacimeter *(1)*. Although the procedure described herein is somewhat specific to this instrument, the general method underlying the procedure may be applied to any instrument which measures opacity through reflectance measurements. The immediate object of the calibration procedure is to arrive at the correct absolute reflectance of the white backing body involved in the definition of "TAPPI opacity" *(2)*. The accuracy with which this objective may be met, and the accuracy of subsequent measurement of TAPPI opacity, depend upon the correctness of the reflectance scale, and upon how well the given instrument duplicates the spectral and geometrical characteristics of the instrument described in the TAPPI Standards *(2, 3, 4)*.

For some time the absolute reflectance, 0.89, of the white backing body involved in the definition of TAPPI opacity has been a source of error and confusion. A discussion of this objectionable feature of the currently employed standard method, together with literature references of interest, may be found in Part I of this report *(4)*, a copy of which should be at hand for definition of terms. Emphasis was there given to the practical and theoretical advantages of expressing opacity in terms of printing opacity (R_o/R_∞). As long, however, as the industry continues to employ "*C*.89" for the measurement of opacity, it will be necessary to have some simple and reliable means for obtaining a white backing body whose absolute reflectance is 0.89. In order to avoid confusion with reflectance relative to that of magnesium oxide taken equal to 100 per cent, absolute reflectance is expressed as a decimal fraction. For example, the absolute reflectance of magnesium oxide is very nearly 0.98.

Discussion of the White Backing Body

The measurement of TAPPI opacity (*C*.89) involves the use of a white backing body having a reflectance of 91.5 per cent, which is equivalent to an absolute reflectance of 0.89. The errors which arise in this white body have been adequately discussed elsewhere *(4, 5, 6)*. There are two cases to be considered, depending on the nature of the white body:

A. *The white body consists of a permanent standard placed in immediate contact with the paper specimen (without the intermediary of a cover glass).* White backing bodies of this class are of two types—namely, those which are composed of a substance so opaque as to exhibit a negligible "irradiation effect" *(7)* and those which are sufficiently translucent to show an appreciable irradiation effect. These are exemplified, respectively, by ceramic enamel and pot opal glass. The latter type of material has a reflectance which depends strongly upon the size of the illuminated area and the distribution of light therein. Accordingly, the reflectance of such a standard will not be 0.89 *when in contact with a paper specimen,* even though a precise measurement of reflectance of the uncovered standard yielded the apparently proper value, 0.89. While a discrepancy of this origin does not exist for white bodies which show no appreciable irradiation effect, the effective reflectance of such standards when in contact with a paper specimen is different from their reflectance when in the uncovered condition. This variation is due to the geometrical difference in the distribution of the light incident upon the white body when in contact with paper specimens and when uncovered; it will be recalled *(3)* that a measured value of reflectance depends upon the geometrical distribution of the incident light. This statement may be clarified by pointing out that in most instruments an approximately unidirectional beam of light is directed upon the specimen whereas, after penetrating a paper sheet of ordinary optical characteristics, the transmitted light is almost perfectly diffuse in its distribution.

B. *The white body consists of a white standard protected by a cover glass, as is the case in the Bausch and Lomb opacimeter.* The effects described above for white bodies placed in immediate contact with the paper specimen exist and are enhanced by reason of the fact that some of the light which is transmitted by the paper specimen is lost by direct propagation through the edge area of the cover glass. In this case there is a very appreciable difference between the absolute reflectance of the uncovered white body and the effective absolute reflectance of this body in contact with the test specimen, the former being the higher.

Irrespective of the kind of white body employed, the effective reflectance itself depends upon the thickness of the material under test. This effect is not appreciable for paper, because of the small thickness of all papers for which measurement of opacity is pertinent, but the discrepancy is important in relation to the use of the relatively thick opacity standards of opal glass which are frequently employed. When covered by such a standard, the effective reflectance of the white body is different from that of the same body covered by an ordinary white paper. As a result of this effect, which is also due to edge loss of light, opal glass opacity standards may not be considered reliable unless they are evaluated on the instrument to be calibrated after that instrument has been adjusted to read correctly the TAPPI opacity of known paper standards.

In consideration of the above facts it is obviously important to have some means for adjusting the absolute reflectance of the white body to 0.89 under the conditions of actual measurement—that is, with the white body in contact with a paper sheet. Since it is impossible to measure this reflectance directly, it is necessary to check the correctness of reflec-

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* This report is one of a series issued as a part of the instrumentation program of the American Paper and Pulp Association.

Part I of this series (a general discussion of opacity and methods for the measurement of opacity) appeared as Instrumentation Studies XXX in Paper Trade J. 109, no. 4: 29-34 (July 27, 1939).

tance by indirect means. A procedure for accomplishing the adjustment of the white body is given in the following section. Before describing this procedure it should be pointed out that the method will result in contrast ratio measurements closely approximating TAPPI opacity only when the instrument does not have appreciable photometric error (like that due to nonlinearity of the relationship between photocurrent and light intensity when blocking layer photocells are used at a fairly high level of illumination) and when it possesses spectral characteristics approximating those of the brightness response of the normal eye viewing in light from an incandescent lamp operated at a color temperature between 2400° and 2800° K. The latter condition is sufficiently well met for most papers of interest if, as in the Bausch and Lomb opacimeter, the photocell spectral response is similar to the visibility curve of the normal eye, and the light source is an incandescent lamp operated at normal voltage. The condition may be met very nearly by abridged and true spectrophotometers *(8)* if reflectance is taken as I.C.I. visual efficiency for Illuminant A *(3, 4)* expressed on the absolute basis (reflectance of magnesium oxide taken equal to 0.97 when an integrating cavity is employed, and 1.00 when the 45-90 deg. or 90-45 deg. geometry of illuminating and viewing is employed *(9)*.

Procedure for Testing the White Body

The procedure which follows is based upon the Kubelka and Munk theory *(10, 11)*, which is most conveniently employed in this connection in the form of the excellent reflectance-opacity chart prepared by the Colorimetry Section of the Bureau of Standards *(12)*. In addition to this chart, one should have the following materials: *(a)* *uncoated* paper samples covering the working range of opacity and having good formation, preferably no filler content, a neutral white color, and a dull but smooth finish; *(b)* pure magnesium ribbon for the production of magnesium oxide smoke by burning in air; *(c)* goggles equipped with dark glass to protect the eyes from the harmful ultraviolet produced by the burning magnesium; *(d)* inexpensive long-nosed pliers for holding the burning ribbon; *(e)* a flat white surface on which to deposit the magnesium oxide from the smoke—preferably a flat-surfaced block of magnesium carbonate of ordinary grade; *(f)* a working standard of reflectance, to be evaluated in absolute units, and to be used for the various settings of the instrument after the standardization with the magnesium oxide; and *(g)* "Scotch Cellulose Tape" or other adhesive means for holding a single sheet of paper over the sample opening. A working standard, *(f)*, is suggested for checking the reflectance scale, in view of the fragile nature of the magnesium oxide.

First cut the magnesium ribbon in lengths approximately eight inches long, being careful to avoid contamination of the magnesium. Then, by means of a Bunsen burner, ignite a length of the magnesium ribbon, which should be held with pliers. The freshly prepared surface of the magnesia block to be coated should be held in the rising stream of magnesium oxide smoke at a point about four inches above the tip of the flame. The burning of a number of lengths of the ribbon is continued until an essentially opaque layer of magnesium oxide is built up. (Prior to the smoking, a small black dot may be placed upon the surface of the magnesia block at a point comfortably away from the area to be used in the standardization; the opacity of the layer of magnesium oxide can then be judged visually by inspecting the covered black dot). Since much of the smoke is not collected, the burning should preferably be done under a hood *(8, 13)*. A few magnesium oxide surfaces should be prepared in order that obviously defective surfaces may be eliminated.

The magnesium oxide surface is carefully placed over the sample opening of the instrument, care being exercised not to press it against the opening since the oxide layer is easily compressed, and appreciable error might result if the reflecting portion of the layer is projected into the integrating cavity. Adjustment is made to obtain a reading of 0.97 of full scale (97 divisions in the case of the Bausch and Lomb opacimeter). If a working standard is to be used, it should be evaluated at this time, and its absolute reflectance recorded (for example, 0.734). The reflectances which are now obtained for paper should be close approximations to proper absolute values. (If the instrument utilizes the 45-90 deg. or 90-45 deg. geometry of illuminating and viewing, adjustment should be made with the magnesium oxide to obtain a reading of exactly full scale, or 1.00.) The operator should be warned that the reflectance of magnesium oxide and magnesium carbonate is fugitive, and hence the magnesium oxide layers should be removed from the blocks of magnesia when the calibration is completed, and the blocks stored for further use.

With the instrument adjusted to read correctly on the absolute scale, a specimen of one of the several samples to be used in the calibration is placed over the sample opening. A hinge of Scotch tape is then fixed to the top edge of the specimen, so that the sheet may be lifted for checking the reflectance scale and subsequently let down to occupy exactly its previous position. *It is most important that the sheet in contact with the sample opening be fixed in position for the measurement of the reflectances involved in the calibration.*

The specimen is backed by the black body, and the reflectance, R_o, is read and recorded. The specimen is then backed by the white body of the instrument, and the reflectance, R_w, is obtained. It is this reflectance which is affected by the effective reflectance of the white backing body. Finally, the specimen is backed by an opaque pad of exactly similar paper, and the reflectance, $R\infty$, is read and recorded. As an illustration, let us suppose that the following reflectances were obtained:

$$R_o = 0.60$$
$$R_w = 0.831$$
$$R\infty = 0.800$$

Attention is then directed to the reflectance-opacity chart, to which reference has already been made *(12)*. We note that the $R_o = 0.600$ ordinate intersects the $R\infty = 0.800$ line at a TAPPI opacity, $C_{.89} = 0.7075$. Since $C_{.89} = R_o/R_w$, the calculated value of R_w is 0.848. Actually, we obtained a value somewhat lower than this—namely, 0.831. This means that the effective reflectance of the white body is less than the ideal value, 0.89. The white body is then removed from the instrument, and an adjustment is made to increase its reflectance. In the Bausch and Lomb instrument this body consists of a metal cylinder containing a solid cylinder of magnesium carbonate and capped with the cover glass *(14)*. On removing the threaded base of this container, it will be found possible, on loosening a small set screw in the wall of the container, to remove or rotate an inner threaded sleeve which holds the magnesium carbonate. It is

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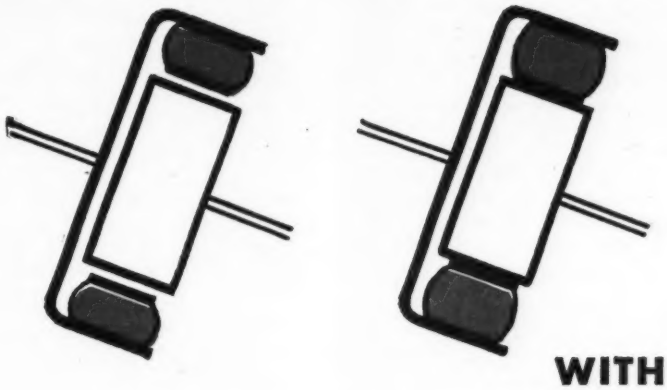

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through adjustment of this sleeve that it is possible to vary the separation between the cover glass and the reflecting surface of the magnesium carbonate. If it is found impossible to obtain a sufficiently high reflectance, even with the reflecting surface in contact with the cover glass, it will be necessary to remove the magnesium carbonate and take off a surface layer, thus exposing a fresh surface of higher reflectance.

After this preliminary adjustment the three reflectances, R_o, R_w, and $R\infty$, are obtained for the several samples of paper, and the corresponding correct values of R_w are obtained from the reflectance-opacity chart as described above. By comparison of these chart values with the directly measured values of R_w, refining adjustments of the white body may be made. After performing the final adjustments, the directly determined contrast ratios for white papers should agree with the chart values rather well, typical discrepancies being about 0.3 per cent, with occasional differences of the order of 1 per cent, the larger discrepancies usually occurring at the lower opacities. Until the contrary is definitely demonstrated, it is believed one cannot visually distinguish between contrast ratios differing by less than about 1.5 per cent *(4)*, and hence the above described method will satisfactorily maintain an instrument in at least a self-consistent state of calibration. Data have been published *(12)* which illustrate the order of accuracy obtainable with the reflectance-opacity chart, and experience with the method as a normal means for calibrating the Bausch and Lomb opacimeter at the Institute has indicated that the procedure is satisfactory.

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Hammermill Gets Fourth Award

For the fourth time the Army-Navy Production Award has been won by the men and women of Hammermill Paper Company, Erie, Pa., and a third white star has been added to their "E" pennant.

In accepting the award on behalf of the papermill's employees, Norman W. Wilson, president, pledged that there will be no let up "in our efforts to give the greatest possible support to our Armed Forces".

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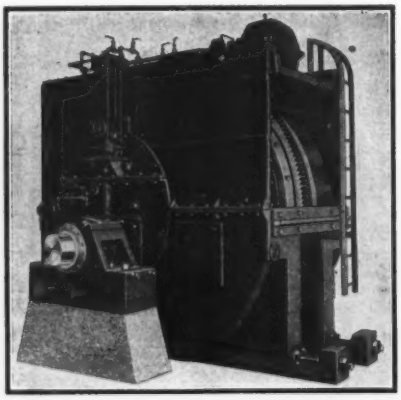
SAVES POWER
SAVES TIME

ROBERTS



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Canada Drives for More Pulpwood

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., October 23, 1944—Harvesting having been completed and many farm workers released for other employment, the drive officially opens this week to recruit men for winter wood cutting operations. Governments are cooperating with the pulp and paper industry and it is hoped that at least as good a wood cut as last year may result.

Last year the campaign to recruit workers did not get started quite so early, but the results showed that 30% more men worked in the woods last season than the season before. The resulting increase in pulpwood supplies helped significantly in maintaining newsprint production and shipments from Canada.

However, the increased cut during the 1943-44 season was not all clear gain, because in return for the assistance given by the governments in directing farm workers to wood-cutting after last year's harvest, the pulp and paper companies suspended entirely all cutting operations during the summer and early autumn, so as to release men for work on the farms during the harvest season.

National Selective Service Director and Labor Deputy Minister Arthur MacNamara has issued an appeal to all farmers and farm workers not needed on farms to turn to essential work this winter and cites particularly the cutting of pulpwood, fuel and timber of all types.

This transferring from the farm to the woods will not affect in any way a farmer's status for postponement of military training, and he may return again to the farm in the spring.

To Start Bag Factory at Houston, Texas

Oneida Paper Products, Inc. of New York city has announced through its president, Irving Zucker, completion of plans, including the letting of contracts, for a factory to be established in Houston, Tex. The new plant will manufacture a complete line of specialty bags and other flexible containers.

The Houston factory will be equipped to serve the food, textile and other industries with packages that have long been featured by his company, Mr. Zucker, said, but preparations also are being made for production of new types of containers which the company is not yet ready to reveal.

Location of the plant in Houston has been made necessary by the growing industrialization and development of the Southwest.

The new plant will be managed by personnel long seasoned in production and sales of specialty flexible containers and will have special knowledge of the need of the Southwest territory.

Heads Educational Committee

BOSTON, Mass., October 23, 1944—Robert S. Elliott, of the S. D. Warren Company, is chairman of the Educational Committee of The Advertising Club of Boston for 1944-1945.

Ellsworth Geist, advertising manager of the S. D. Warren Company, gives a talk in an advertising course, presented by The Advertising Club of Boston, on January 4, 1945. His subject is "Printed Promotion." He will discuss: "How printed promotion is used to coordinate and direct sales effort, to increase the productivity of a sales organization, and to effect economies in advertising."

We're in it for the duration

SINCE 1828

Continuously We Have Served The Paper Industry.

Since War II was declared we have used all our manufacturing facilities, and done our small part to help build our fighting machine for war.

At the same time we have been planning for peacetime equipment and improvements NOW!

We have some of our machines available to produce new machinery for civilian products.

Paper Machines
Paper Bag Machines **Paper Cutters**
Can be built with a PDIA Priority rating.

THE SMITH & WINCHESTER
MANUFACTURING COMPANY
PLANT AND OFFICES AT SOUTH WINDHAM, CONNECTICUT

Canadian Associations Form Joint Board

Pulp and Paper Association and Newsprint Association Cooperate To Set Up Executive Board To Act As Authority For the Whole Industry — Prices Board Removes More Restrictions On Paper.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 23, 1944—What may be termed the keystone in the arch, as far as unity within the Canadian pulp and paper industry is concerned, has at last been fashioned and erected. It comes with the announcement that the executive bodies of the Canadian Pulp and Paper Association and the Newsprint Association of Canada, both of which organizations have their headquarters in Montreal, have established a Joint Executive Board of the two associations to serve, when required, as the single representative body of the pulp and paper industry in matters of common interest. The chairman of the Board will be Charles Vining, the president of the Newsprint Association, and the vice-chairman will be E. Howard Smith, of the Pulp and Paper Association. The membership of the Board will be equally divided between the two associations, belonging to which associations are more than 98% of all pulp and paper companies in Canada, by whom is produced more than 98% of the pulp and paper output of the country. The Joint Board, therefore, will be representative of the entire Canadian industry, and will act as the directing authority of general industry committees.

Authority Conferred on the Board

The Board has authority to convene and conduct, from time to time, a combined meeting of the two association executive bodies or of the two associations. In this way there is provision, for the first time, for calling a representative meeting of the pulp and paper industry as a whole, should such a need arise.

The Board will hold regular quarterly meetings in March, June, September and December of each year and such meetings will be open, for discussion, to all members of either association. The first quarterly open meeting will be held in Montreal on December 7. The Board will also hold interim meetings from time to time.

The first members of the Board, numbering 22, were elected by resolutions of both association executive bodies, and will hold office until next annual meetings, which means probably until February. Subsequent members of the Board are to be elected each year at the annual meetings of the associations.

The present members of the board are as follows:

Representing C.P.P.A.: George W. Brown, president and general manager, Gair Company Canada, Ltd.; A. E. Cadman, secretary-manager, C.P.P.A.; G. L. Carruthers, assistant general manager, Interlake Tissue Mills Company; Paul E. Cooper, president Pacific Mills; Aubrey Crabtree, president and general manager, Fraser Companies; G. Gordon Gale, president, The E. B. Eddy Company; F. G. Robinson president, Rordon Sales Corporation; J. P. Rolland, vice-president, Rolland Paper Company; E. Howard Smith, vice-president, Howard Smith Paper Mills; R. L. Weldon, president, Bathurst Power and Paper Company; and C. R. Whitehead, vice-president, Consolidated Paper Corporation.

Representing N.A.C.: L. J. Belnap, president, Consolidated Paper Corporation; G. T. Clarkson, receiver and manager, Abitibi Power and Paper Company; Harold S. Foley, president, Powell River Company; John H. Hinman, president, Canadian International Paper Company; Col. C. H. L. Jones, president, Price Bros. & Co.; Paul Kellogg, general manager, N.A.C.; Robert P. Kernan, president, Donnacona Paper Company; E. M. Little, general manager, Anglo-Canadian Pulp and Paper Mills; C. H. Sage, president, Spruce Falls Power and Paper Company; Charles Vining, president, N.A.C.; and A. F. White, chairman, St. Lawrence Corporation.

Culmination of Years of Effort

The formation of this Joint Board, effected at last by compromise, is the culmination of many years of effort and of bitter experience. The movement towards unity began some quarter of a century ago with the formation of the Canadian Pulp and Paper Association, which brought into the membership of one organization producers of every type of paper and of pulp. While acting together on matters of general interest and for the welfare of the industry as a whole, the various member companies, however, continued to be actively competitive in all matters concerned with marketing. In periods of boom company promoters and politicians between them brought about an enormous and premature expansion of the industry. Provincial governments granted charter after charter for the exploitation of pulpwood limits, usually with the express provision that a pulp mill or newsprint mill of a stated capacity must be erected within a brief stipulated period on pain of forfeiture of the charter. The result was new production coming on to the market all the time, often beyond the capacity of the market to absorb. Thus the efforts of existing producers, as represented in the Canadian Pulp and Paper Association, for close unity on all matters were constantly being nullified by units dominated by stock market interests.

The situation became particularly acute in the newsprint branch of the industry, and in the last depression culminated in such cut-throat competiton, and such stealing by companies of other companies' customers, that in the end wholesale bankruptcy enveloped the whole industry. It was then that the Newsprint Export Association of Canada was formed to bring something like order to marketing processes, the membership being restricted to producers of newsprint. This organization, whose name was subsequently changed to the Newsprint Association of Canada, thus indicating its interest in broad matters of policy rather than in matters pertaining merely to export, has done excellent work in its own field.

Discussion of a merger between the two associations has been under way for a long time past, but in both organizations there were groups who considered that special interests were involved which could best be served if the two remained as separate entities. However, it was agreed that in a broad way, and on fundamental problems common to both, the interests of the two were as one, and should speak with a unified voice. Hence the action taken.

PUTTING A PUMP IN ITS PLACE

FOR UNIFORM STOCK SUSPENSION

This elbow-type, propeller-type centrifugal pump shown as installed in a prominent Midwestern mill, was designed with low head and high capacity for circulation and agitation in diffuser chest.

*To Solve New Problems of "Wood Conversion" Call in a Worthington P. A. E.**

As new by-products, new processess — bringing new horizons to pulp and paper industries — are turning paper mills into the "wood conversion plants" of the future, millmen are calling on Worthington P. A. E.'s to solve their pumping problems.

What pump can handle this or that liquid without periodic costly shutdowns? *Where* and *how* should it be installed? What head, what capacity for this or that type of service? Worthington P. A. E.'s (their "rating" means longest, broadest experience with *all* types of process problems) are best able to advise you.

"Worthington Builds 'em All"

Troubled by corrosion? Abrasion? Heat? Viscosity? Solidification? Worthington offers *all* sizes and types of centrifugal pumps for pulp and paper processes. Ask a Worthington P.A.E. to recommend the right pump for you. Write us, or call our nearest district office. *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

WORTHINGTON *BEHIND THE NAME* WORTHINGTON

*P. A. E. — Pump Application Engineer

CP4-81

THE WORLD'S LARGEST MANUFACTURER OF PUMPS

STEAM POWER ROTARY VERTICAL TURBINE CENTRIFUGAL

Dr. Earl C. Sherrard Dead

Dr. Earl C. Sherrard, 58, widely known chemist at the United States Forest Products Laboratory at Madison, Wis., and for many years an international authority in the field of wood chemistry, died Thursday night, October 5, at a Madison hospital. He had suffered a heart attack recently.

Chief of the laboratory's division of wood and derived products since 1930, Dr. Sherrard joined its staff October 15, 1917, shortly after taking his doctorate degree at the University of Michigan. As chief of the division, he supervised and directed research in the chemistry of wood cellulose, lignin, extractives and wood preservatives, wood sugars, the production of ethyl alcohol from wood and lignin plastics, and lignin hydrogenation.

Much of his work was aimed at finding new uses for wood waste such as sawdust, chips and paper mill refuse, and at solving the complex mysteries of wood's chemical makeup.

A few weeks ago Dr. Sherrard addressed a special symposium of the American Chemical Society in New York City on the history of ethyl alcohol research in the United States. During the last year he directed research that has resulted in a highly-efficient process for the production of ethyl alcohol from wood.

He was born June 14, 1886 at Montpelier, Ind. From 1904 to 1906 he taught chemistry at Tri-State College, Angola, Ind., of which his father was president. Later he operated a drugstore, and after that he taught pharmacy and chemistry at Tri-State before entering the University of Michigan.

Sandy Hill Completing U. S. Orders

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., October 24, 1944—Officials of the Sandy Hill Iron and Brass Works report that government orders have been nearing completion during the past few months and cancellations are anticipated on others. The cancellations are said to be reducing the number of shipments to be met monthly. In the past, according to announcement, the government demanded every possible delivery each month in order to build up a striking power and this meant production on a twenty-four hour basis with three shifts. It was also stated that cancellations and deferment of shipments have made this unnecessary and the company has eliminated night work as far as possible. As future contracts are completed or cancelled the company has plans for reconversion to paper mill machinery and expects no interruption as the government orders fall off.

Glens Falls Men Get Patents

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., October 24, 1944—True M. Avery, an official of the Union Bag and Paper Corporation, and William H. Bekenkroger, of this city, have been granted a patent on a new species of paper bag embracing several original ideas. Patent rights have been assigned to the Union Bag and Paper Corporation.

Alfred E. Van Wirt and Andrew G. Aylies, of this city have been granted a patent on a method of producing alkali-metal chromates from chromite ore with a number of claims to originality allowed. Rights have been assigned to the Imperial Paper and Color Corporation.

Issues Pricing Method for Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 25, 1944—A method by which producers can determine their maximum prices on semi-chemical wood pulp was announced by the Office of Price Administration today.

This grade of wood pulp, a raw material used in the manufacture of a variety of finished paper and paper products, was not previously sold in the open market and hence was not covered by the wood pulp maximum pricing regulation.

The method to be employed by producers in establishing maximum prices for semi-chemical wood pulp, effective October 28, 1944, calls for the submission to OPA's national office in Washington, D. C., of information in the form of a sworn statement concerning grades and proposed selling prices similar to that required for producers of other special grades of wood pulp.

After this information has been received by OPA, the applicant may sell and deliver the semi-chemical wood pulp at its proposed price, provided it is expressly agreed with each customer that the price will be adjusted, if necessary, to conform with any action taken by OPA on the application.

If after 30 days OPA has not ordered any change in the proposed price, it may be considered the established maximum price.

September Newsprint Statistics

Production of newsprint in Canada during September 1944 amounted to 244,209 tons and shipments to 252,928 tons according to the News Print Service Bureau. Production in the United States was 61,529 tons and shipments 61,069 tons. The output in Newfoundland was 25,476 tons and shipments were 31,127 tons making a total North American production of 331,214 tons and shipments of 345,124 tons. Total production in September 1943 was 338,761 tons and shipments were 334,370 tons.

The Canadian mills produced 14,317 tons more in the first nine months of 1944 than in the first nine months of 1943, which was an increase of six tenths of one percent. The output in the United States was 78,618 tons or twelve and eight tenths percent less than in the first nine months of 1943; in Newfoundland production was 37,184 tons or twenty-two and nine tenths percent more, making a net decrease of 27,117 tons, or nine tenths of one percent less than in the first nine months of 1943.

Stocks of news print paper at the end of September were 49,725 tons at Canadian mills, 7,177 tons at United States mills, and 46,886 tons at Newfoundland mills, making a combined total of 103,788 tons compared with 117,698 tons on August 31, 1944, and 117,411 tons at the end of September 1943.

Fonda Co. Acquires Machinery

[FROM OUR REGULAR CORRESPONDENT]

ST. ALBANS, Vt., October 24, 1944—H. J. Wallace, general manager of the Fonda Container Company, here, has announced that the company has acquired all the machinery and equipment of the Sanitary Container Company in Moorseville, Ind., for the production of pressed paper pie plates and paper board food trays. It is understood that the battery of pressed paper plate machines which the Fonda Container Company has acquired, is the second largest in the country.

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending October 21, 1944

STOCKS

	High	Low	Last
A. P. W.	3⅞	3¾	3⅞
Armstrong Cork Co.	45½	44¾	45¼
Celotex Corp.	14¼	13⅜	14⅛
Celotex Corp., pf.	18⅝	18	18
Certain-Teed Products Corp.	7¼	6⅝	7⅛
Certain-Teed Products Corp., pf.	122½	113¼	122½
Champion Paper & Fibre Co.	30¾	29½	29⅞
Champion Paper & Fibre Co., pf.	113¾	112½	113
Congoleum Nairn Co.	26½	26¼	26½
Container Corp. of America	29⅛	27⅞	28⅝
Continental-Diamond Fibre Co.	11¾	11	11¼
Crown-Zellerbach Co.	20⅜	18⅞	20⅛
Crown-Zellerbach Co., pf.	102¾	102	102⅛
Dixie Cup Co.	18⅞	18½	18⅞
Dixie Cup Co.,—A.	47½	47	47½
Flintkote Co.	23½	22½	23½
Flintkote Co., pf.	107½	107½	107½
Robert Gair	4¾	4⅝	4⅝
Robert Gair, pf.	16¾	15¾	16
International Paper Co.	20¼	19	19¾
International Paper Co., pf.	88⅜	85½	88¼
Johns-Manville Corp.	101	99½	100
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	40¾	40	40⅛
MacAndrews & Forbes	29¾	29¼	29¼
MacAndrews & Forbes, pf.	...	...	...
Masonite Corp.	44	43⅜	43⅜
Mead Corp.	12⅛	11¼	12
Mead Corp., pf. A—6%	99	98¼	99
Mead Corp., pf. B—5½%	93	93	93
National Container Corp.	12	10⅝	11⅛
Paraffine Companies, Inc.	58	58	58
Paraffine Companies, Inc., pf.	106½	106½	106½
Rayonier, Inc.	17⅛	16¾	16¾
Rayonier, Inc., pf.	33¾	33⅛	33¾
Ruberoid Co.	34	33	34
Scott Paper Co.	43¾	43	43
Scott Paper Co., pf.	113½	113½	113½
Sutherland Paper Co.	...	...	...
Union Bag & Paper Corp.	14	13⅜	13⅞
United Paperboard Co.	7⅛	6⅞	7
U. S. Gypsum Co.	79¾	79½	79½
U. S. Gypsum Co., pf.	180	178½	178½
West Virginia Pulp & Paper Co.	24⅜	24	24
West Virginia Pulp & Paper Co., pf.	108	107⅛	107⅛

BONDS

Abitibi Pulp & Paper Co. 5s '53	87½	87	87½
Celotex Corp. 3¾s '55	104	104	104
Certain-Teed Products Corp. 5½s '48	102⅛	101¾	102⅛
Champion Paper & Fibre Co. 4¾s '50	...	...	...
International Paper Co. 6s '55	108½	107½	108⅛
International Paper Co. 5s '47	103½	103½	103½
Merd Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending October 21, 1944

STOCKS

	High	Low	Last
Great Northern Paper Co.	36¼	35½	36¼
Hummel-Ross Fibre Corp.	7⅞	7½	7¾
St. Regis Paper Co.	6	5⅜	5⅞
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	...	...	...

BONDS

American Writing Paper Co. 6s '61	...	...	...

Keyes Fibre Co. Asks SEC Approval

The Keyes Fibre Company, Portland, Me., asked the commission today to approve its proposed issuance of $1,800,000 of Series A 4% first mortgage sinking fund bonds, due in 1959. The proceeds would be used to redeem $1,138,000 of outstanding 4½% bonds and to provide $600,000 for new construction and plant expansion. Coffin & Burr, Inc., will underwrite the new bonds. Keyes Fibre is a subsidiary of the Northern New England Company.

Sutherland Nets 59 Cents

The Sutherland Paper Company, for the three months ended September 30, reports a net income $170,047 after taxes and charges, equal to 59 cents a share on 287,000 common shares; year ago $173,512 and 60 cents a share; nine months' net income $508,756, equal to $1.77 a share; year ago $544,320 and $1.89 a share.

R. J. Egan Returns to Bulkley, Dunton

Roger J. Egan, who for the past two years has acted as Eastern Representative of the Puget Sound Pulp and Timber Company and the Soundview Pulp

ROGER J. EGAN

Company, has returned to the Bulkley, Dunton Pulp Company. Mr. Egan's headquarters will be in the company's New York office. He joined Bulkley, Dunton in 1922.

Changes Paper Napkin Pricing

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 25, 1944—Distributors' maximum prices for paper napkins sold in bulk will be determined per thousand napkins rather than per case, the Office of Price Administration announced today.

This change, which is effective October 24, 1944, has been made at the suggestion of the Industry Advisory Committee. It will restore the pricing unit Coarse Paper Merchants employed from October 1 through October 15, 1941. All other items under the same regulation are being priced on this historical basis except bulk napkins. This action will remove the existing unintentional discrimination and restore the October 1 through October 15, 1941 mark-up, which has been determined to be fair and equitable.

Although today's change will cause an increase in maximum prices for this product, the increase will be absorbed by industrial and commercial users, such as restaurants, hotels, etc., OPA said.

Distributors determine their maximum prices by taking the manufacturer's ceilings and adding specified dollar-and-cent mark-ups.

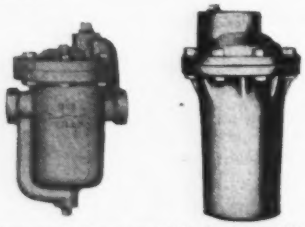
Geo. Olmsted Jr. to Speak on Paper

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., October 23, 1944—George Olmsted, Jr., president of the S. D. Warren Company, and for the last two years Consultant and Advisor to the War Production Board and the Office of Price Administration, is to speak on "Paper—The Critical Problem" at the next meeting of The Bookbuilders of Boston, to be held November 21 at the Hotel Lenox.

● Developed specially by Armstrong for paper dryer roll service, these traps have extra air elimination capacity in addition to their regular function of removing condensate without steam loss. Results are higher production and lower costs, through faster heating, better quality paper and fuel savings. Users say there is nothing like this trap for dryer roll service.

Other production aids for paper industries: Armstrong compound traps for digesters, evaporators, etc. . . . forged steel traps for high pressure power plant service . . . and regular traps for heaters, cooking tanks, space heating coils, unit heaters and other equipment.



Armstrong Traps available in both side-inlet, side-outlet and bottom-inlet, top-outlet styles.

INVALUABLE FOR YOUR FILES—write for copy of Armstrong Trap Book, illustrating construction, operation and application details.

ARMSTRONG MACHINE WORKS

816 Hoffman St., Three Rivers, Mich.

Hold Post-War Conference

With emphasis on post war planning, the sales representatives of Central Paper Company spent the week of September 17th in conference at the general offices in Muskegon, Michigan. Considering the rapid advancement of paper treatments and usages during the war, and the possibilities for paper in the post war work, this conference was probably one of the most important in Central's history.

PICTURE OF SALES MEETING OF CENTRAL PAPER CO.

Left to Right—J. E. Wilson, Buffalo; G. Westerberg, manager New York office; H. E. Bouis, St. Louis; H. C. Engel, manager Chicago office; C. W. Smith, president and general manager; Edgar A. Hall, Jr., Cincinnati; F. C. Vogel manager Detroit office; A. D. Keillor, Detroit; F. J. Ford Blickley, Detroit; John Shay, manager Boston office. Standing: Left to right—W. H. Erickson, Chicago; D. H. Strickland, sales supervisor, general offices; Ray Terrien, senior sales supervisor, general offices; W. H. Cochran, Baltimore; L. J. Walker, Chicago, and L. Powers, New York.

Special attention was given to plans for converting war-born papers to peace-time applications in three way conferences between sales representatives, laboratory technicians and production heads. Future sales and merchandising plans were thoroughly discussed and the 1945 advertising program was outlined. At the end of the conference the Central representatives left with a well formulated, progressive sales program for post war work.

Incidentally, this was the first sales conference to be held in the new Central Paper Company general offices, judged by many to be the most modern in the industry. Charles W. Smith, president and general manager, presided at the meetings and it is his belief, as well as those attending, that the results of this war-time meeting will be of benefit to the entire paper industry as well as to all paper dealers and consumers.

Pulpwood Output Good

WASHINGTON, D. C., October 25, 1944—While the record of pulpwood output has been generally excellent during recent months, Government demand for pulp, paper and paper products reached a wartime peak in September and October and the net result is a continuing tightening of supplies available for civilian use, according to the October Pulp and Paper Industry report released today by the Department of Commerce.

The printing and publishing industries confronted this problem for the fourth quarter of the year by agreeing to a further reduction in inventories instead of a further curtailment in the use of printing papers.

Truck tires probably are the major bottleneck which conceivably could retard the production of the entire industry, the report states. New trucks continue to be allocated on a limited basis, but it is reported that most approved applications are being filled. Nevertheless, maintenance of trucks will be a serious problem, especially in the Lake States, if a difficult hauling season is encountered during the coming winter and spring, and considerable delays in getting wood to mills may be encountered through truck failure alone.

The 8,000,000-ton goal set for the year in waste paper receipts, calling for an average of 667,000 tons monthly, was approximately a month behind schedule at the end of August. However, the War Production Board has announced that the special incentive, nationwide drive launched by the Boy Scouts of America on August 1 to run through October 1 was one of the most successful ever attempted. Since more and more volunteers are needed to help in the salvage drive, WPB enlisted the aid of the Girl Scouts and on October 1 nearly a million of the latter started a campaign to salvage tin, paper and rags, with the chief emphasis on waste paper.

Hungary Makes More Paper

At the beginning of the war, Hungary's thirteen paper factories, employing some 3,000 workers, were producing on an average 60,000 tons of paper per year or enough to cover approximately 60 percent of the local demand, says a report received recently at the Department of Commerce. Today, according to local press reports, Hungary's annual output of paper has reached 90,000 or 95,000 tons but because domestic consumption has kept pace with increasing production it is still found necessary to allocate available supplies to insure equitable minimum distribution.

The area of state-owned woodlands was recently increased from 1,700,000 acres to 6,420,000 acres through the re-incorporation of Transylvania and the Carpathian regions in Hungary. However, the lack of transportation facilities, the necessity of providing the Hungarian population with fire-wood, and the priority on any available timber which building enterprises have been granted make it impossible at present to consider the establishment of a local industry for the production of woodpulp for paper making. The industry must therefore continue to rely on imports of woodpulp from Sweden, which now amount to approximately 40,000 tons per year, and such waste paper as they can collect from time to time.

Hold Wood Conference

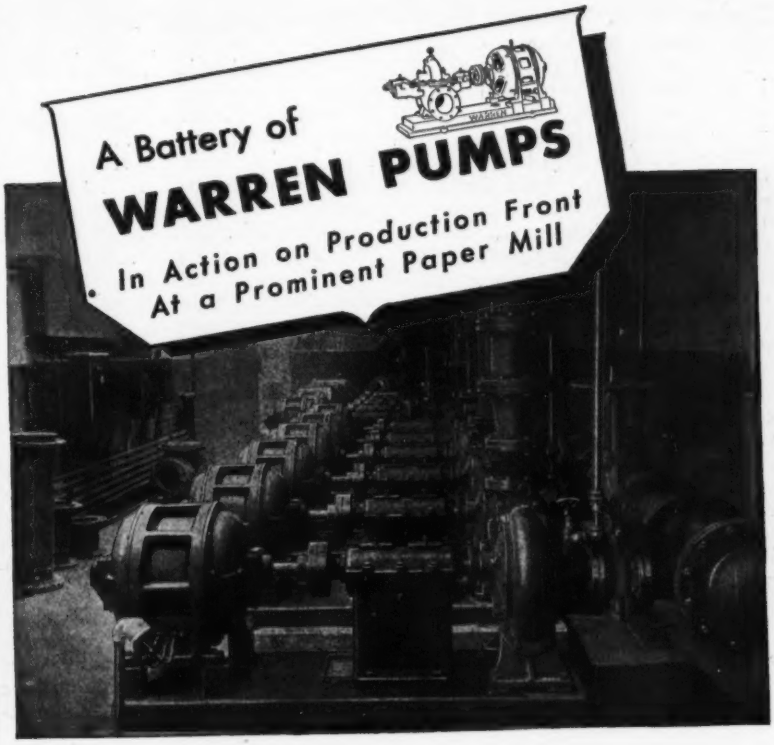
The importance of forests to the present and future economy of the Northeast was emphasized during the quarterly meeting of the Northeastern Wood Utilization Council held in Durham, New Hampshire, on September 21. Host of the meeting was the University of New Hampshire, with Dr. D. S. Eppelsheimer, President of the Council and Director of the Engineering Experiment Station presiding.

The main topic of discussion was the production of protein from wood and wood waste—important for areas such as the Northeast, Appalachian, Cumberland and Pacific, which have to import their protein requirements for cattle feed. The wood and waste in these regions is adequate to supply a substantial part of the requirements of cattle fodder in these regions, without interfering with the output of lumber.

The Secretary of the Northeastern Wood Utilization Council, which was founded by him several years ago for the purpose of making better use of this largest resource of the Northeast, is Mr. Edgar L. Heermance of New Haven, Connecticut, who is also Secretary of the Connecticut Forest & Park Association and a prominent figure in the wood-using industries of New England. Other members of the Council come from all the six Northeastern States. The Field Director is Mr. Robert S. Aries, whose articles on the subject of wood-utilization and chemistry are well known.

Among the other topics discussed at the meeting were improved stoves for heating and cooking; the use of low grade wood for plywood and lamination; the production of plastics from sawdust and shavings, etc. Other research projects with which the Council is associated are debarking and bark-utilization, pulp and paper, and improvements in the harvesting of wood.

Among the visitors at the Durham meeting were Mr. George W. Trayer, Chief of the Forest Products Division, U. S. Forest Service, and Dr. J. A. Hall, also of the Forest Service, U. S. Department of Agriculture. Dr. Hall has been largely responsible for the wood-hydrolysis plant being erected in Oregon for the production of ethyl alcohol.



And, like the men, women and equipment in all branches of the armed forces, these pumps are giving a good account of themselves. They stick with their jobs, through thick and thin, at remarkably low operating and maintenance costs. This goes for Warren Stock Pumps, Machine Chest Pumps, Liquor Pumps and Fresh Water Pumps. In other words, for low pumping costs on all Paper Mill services, specify:

WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC.
WARREN, MASSACHUSETTS

Indianapolis Demand Heavy

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 23, 1944—The war situation in Europe has caused the local paper trade to revise its estimates on when more paper and paper products will become available. From all indications now there will be fighting yet in Europe far past the first of the year and the local trade is expecting no particular improvement in the supply situation until this phase of the war ends. Even then they are not looking for much immediate improvement, but any at all would be very welcome.

At the present time there appears to be a sufficient supply of building paper and roofing in the local area. New construction, stimulated somewhat by an easing of priorities, will be more active this fall than last if materials are available and just now it seems they will be. Stocks of roofing and building paper in local jobbing plants are a trifle larger than they were a year ago.

Demand for fine paper, including books, ledgers and covers continues to be heavy, more than the supply. Indicative of the shortage of these items is the new telephone directory, which is smaller than that of the previous issue, due to contractions and other paper economies. The Polk company failed to issue a city directory this year, due to paper shortage and it is said none will be issued at least until next February.

Demand for containers continued heavy last week, with containers going into the war effort taking the bulk of the production. The factories continue to be troubled with labor shortage difficulties and no improvement is expected until after the war has ceased in Europe and soldiers are being discharged on a larger program than at present. The factories are producing to the utmost of their capacity under prevailing conditions. Tissues were in good demand with a shortage noticeable in cleaning grades.

Mill demand for wastepaper of all grades continued heavy with local warehouses showing low stocks and all prices hitting ceiling levels. Rag demand was good with prices high.

Marking Packages

A. H. Chamberlain, executive secretary of the National Paper Trade Association has sent out the following notice regarding the marking of packages:

"At our recent meeting in Chicago attended by the executive committee of our board of directors and about 175 association members, a resolution was adopted that we should bring to the attention of manufacturers the great need of improvement in marking the contents of packages and cartons of merchandise shipped to merchants.

"It was brought out that under emergency conditions and the necessity of resorting to makeshift packing, great laxity has developed which has been aggravated by labor shortage requiring the employment of inefficient and often careless help. The receipt by paper merchants of packages and cartons the contents of which cannot be identified because of defaced, illegible or otherwise inadequate marking, causes much unnecessary handling and loss of warehouse time.

"We therefore respectfully urge that you give special consideration to this matter, checking your shipments to insure that proper labels are applied so that stockmen and order fillers in the merchants' warehouses and the receiving clerks of merchants' customers can readily tell what they are handling and what they are getting.

"Your careful attention to this important matter will greatly benefit all members of the trade."

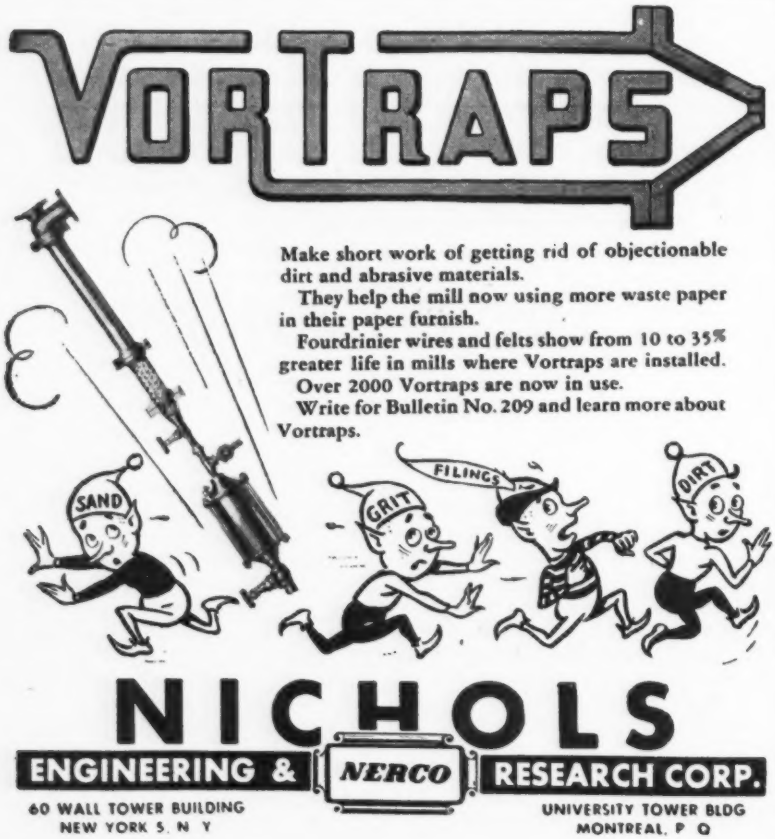
More Newsprint Needed

An increase in the supply of newsprint at the earliest possible moment after V-E day so that advertising volume can be expanded and a "serious threat" to both production and distribution averted was urged by John C. Watson, president of the New York State Council of Retail Merchants, Inc., in a letter to J. A. Krug, War Production Board chairman.

Both production and distribution will bog down after the collapse of Germany, Mr. Watson warned, if the merchandise that is manufactured is not sold. "It will not be sold," he added, "unless the merchant is provided with the opportunity to advertise."

"Advertising will be the spark that will fire our economic engine when we turn to the pursuits of peace," the letter asserted. "At that time business in general, both in production and distribution, must work with unprecedented energy, enterprise and ingenuity to provide employment for millions of men and women. The task requires careful and intelligent planning now if we are to advance the levels of economic and social welfare and avoid disaster.

"Volume is the only chance of saving our economy. If we do not get it nothing will save the situation."


VORTRAPS
Make short work of getting rid of objectionable dirt and abrasive materials.
They help the mill now using more waste paper in their paper furnish.
Fourdrinier wires and felts show from 10 to 35% greater life in mills where Vortraps are installed.
Over 2000 Vortraps are now in use.
Write for Bulletin No. 209 and learn more about Vortraps.
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NEW YORK 5, N. Y.
UNIVERSITY TOWER BLDG
MONTREAL, P. Q.

To Boost Specialty Sales in Post-War Period

Outlining a broad program designed to put salesmen of paper merchants in position to compete for the more profitable printed business, Irving Zucker, president of Oneida Paper Products, Inc. declared paper jobbers throughout the country can realize a handsome return from specialty sales efforts. Such efforts, he said, will help peace-time industry adapt to its uses improved packaging techniques and materials developed originally to meet the extraordinary demands of a war-time economy. By employing war veterans to do the job, paper distributors can profitably help break a threatened bottleneck in distribution, one of the more serious obstacles to retention of a high rate of employment and a high standard of living, he asserted.

It was explained that the new program will place in the hands of paper jobbers and their salesmen a simplified sales set-up on printed specialty bags and envelopes, comparable to the selling methods used now for unprinted stock items.

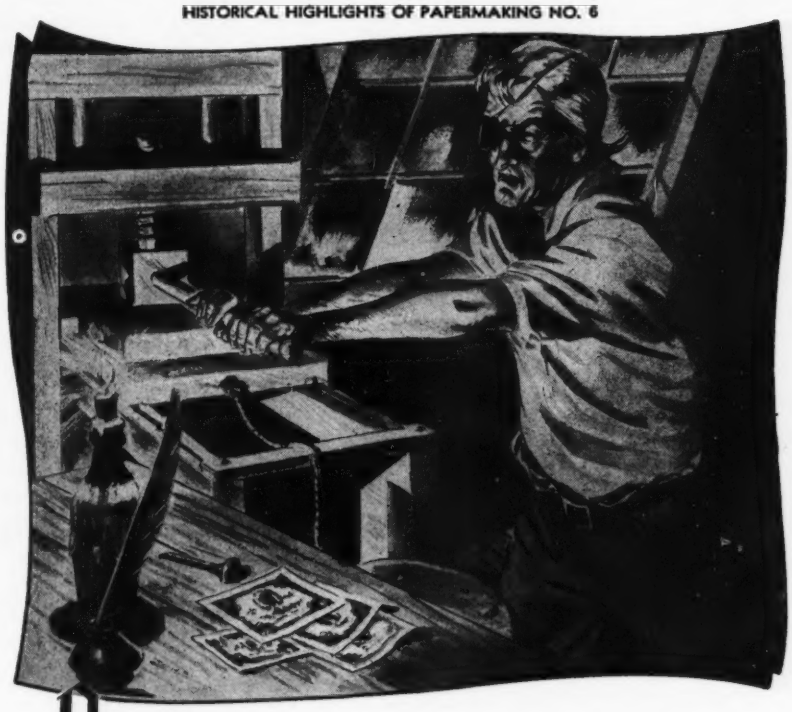
The statement issued by Mr. Zucker, president of Oneida Paper Products Inc., in part, was as follows:

"Oneida Paper Products, Inc., is certain that paper merchants want to help the nation convert from a war-time to a peace-time basis. This they can do, with substantial profit to themselves, by adding to their sales staffs numbers of returning war veterans who can be readily taught to sell specialties the Oneida way, a method which will not involve complex calculation of prices and which will eliminate delays that formerly cramped the specialty sales efforts of jobbers' salesmen.

"I should say the 'post-war' years will present paper merchants with a golden opportunity to assist peace-time industry to adapt to its uses the numerous improved packaging techniques and materials which have been developed to meet the urgent demands of a war-time economy.

"Inadequate distribution is certain to prove one of the most serious obstacles to quick rehabilitation of peace-time industry and to increased employment. It is our hope to contribute materially to solving distribution problems by making this new sales plan available to all paper merchants, after we have had an opportunity to test it within a limited area and have eliminated 'bugs' which may show up in practical administration of the program."

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 6



Old Patch, the Counterfeiter

One of the most skillful counterfeiters in the annals of crime was a slick operator known as "Old Patch," because he wore a black cloth over one eye.

"Old Patch" was as clever as he was crooked. He had rare skill as a designer, engraver, papermaker and printer. It was back about the time of the Revolutionary War that he decided he could make as good a bank note as the Bank of England. So skillfully were his notes engraved and water-marked that the Bank of England accepted them without question.

"Old Patch" had a small paper mill where he duplicated Bank of England notes to the most minute degree. Finally, however, after twenty years, his bank notes were found to be counterfeits, and the authorities caught up with him. But "Old Patch" cheated to the last. He cheated the hangman out of his fee by hanging himself while awaiting execution.

☆ ☆ ☆ ☆

Quite a different type of historical highlight was the founding of Cheney Bigelow in 1842. For the greater part of 100 years we've been making the Fourdrinier wires and other mill essentials that have helped make papermaking the great industry it is today. During wartime, we have continued to serve the paper industry while making antiaircraft guns and other weapons. Our wartime effort has won us the Army-Navy "E."

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Fourdrinier Wires • • Dandys • • Cylinders • • Wire Cloth

CHENEY BIGELOW WIRE WORKS · 417 LIBERTY STREET · SPRINGFIELD, MASS.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

CHICAGO PROFESSIONAL PAPER GROUP—Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PULPWOOD RECEIPTS INCREASE

Increasing pulpwood receipts at the mills continues as an encouraging factor in the raw materials supply situation. The current surplus status is excellent but more pulpwood is required to meet the heavy overall demand. Mill receipts of wood for the first eight months of 1944, as reported by the Department of Commerce, aggregated 11,414,000 cords, compared with 9,507,000 cords in the corresponding period in 1943. The total comprised 10,328,000 cords of domestic wood, an increase of 25%, and imports of 1,086,000 cords, a decrease of 6% below 1943. Consumption of pulpwood for the eight month period totaled 10,759,000 cords, which was 7% more than in 1943. Consequently, inventories at the end of August 1944 aggregating 3,337,000 cords, showed an increase of 23% above August 1943.

In its comprehensive current report on the pulpwood supply situation, the Department of Commerce states that the Northeast was the only region which showed a generally unfavorable picture. Receipts so far this year were about 2% higher than for the same period in 1943; imports from Canada were 4% below those received during the corresponding eight months of last year; consumption in the eight months was 6% lower. Inventories at the end of August were 15% below 1943. A critical production and labor supply problem continues to exist, requiring continued and increased efforts to produce pulpwood. Stress must be placed upon cutting long-fibered spruce and fir and less hardwood, the report states. August receipts of pulpwood in the Appalachian region were 6% above a year ago, and for the eight months 33% above the like period last year. With the peeling season having ended in August, it has been estimated that the amount of peeled wood produced would not meet the full requirements in this region.

Receipts of pulpwood in the Southern region were 24% higher than in August of last year, and 17% above the eight month period of 1943. This marked improvement is counter balanced by the fact that labor and mechanical facilities in the mill yards and pulp mills at some of the Southern plants, have created new production problems. The report points out that pulpwood inventories are said to be spotty throughout the South, entailing a further production hazard, should the weather remain unfavorable over a protracted period. Some mills with full mill yards are banking wood on roadsides and roalroad sidings as a precaution against wet weather hampering hauling in the forests. In the Lake States region, the report states a 63% improvement for the eight month period of 1944 over 1943. A year ago, inventories were extremely low, and therefore the 28% improvement this August compared with August 1943 should not warrant too much optimism, the report goes on to say, since large quantities of rough poplar are included, requiring an additional effort to produce more urgently required spruce and fir this fall and winter.

In the Pacific Northwest, the Department reports that the fire hazard has been continually present and though August had much fine logging weather, early September was extremely dangerous. Such a critical situation existed that all logging was temporarily stopped, but wet weather soon allowed resumption of operations. This stoppage plus the fact that the heavy duty truck tire situation is critical, will no doubt lower September pulpwood receipts under August, when receipts reached their highest point for the past twenty-three months. The Department reports in reference to truck tires that in order to protect and stretch the available supply of heavy duty tires upon which the logging industry is so heavily dependent, the WPB has issued a conservation guide. This guide urges conservation of tires by improving roads, reducing cross-hauling, recapping tires, and checking the conditions of trucks and their operation. Critical shortage of trucks, tires, and gasoline have made it necessary for the ODT to set up strict requirements for all prospective purchases of used trucks. Before acquiring vehicles, their proposed operations would have to be only those considered necessary to the war effort and essential civilian economy, and authority to operate a truck should be obtained by a prospective purchaser before actual purchase is made.

In its report on labor harvesting pulpwood, the Department reports that there has been an increase recently in the number of war prisoners, with small additions being made in the South, through to New England. Though now numbering about 9,200, no new camps have been established, but more men are being worked out of the existent camps. In addition to the increase in the number working, the output per man per day has been increased. As anticipated, in the South some war prisoners were temporarily taken from pulpwood cutting and are being utilized for harvesting. However, a large number of prisoners will be available in October if they are needed to fill the capacity of existing camps or for any new camps which may be planned at a later date. The minimum size of camps, requiring 250 men, is a

problem in many areas where conditions cannot justify this rather large-sized operation. Throughout the United States, prisoners of war actually worked, during August, approximately 249,668 man-days in forestry and logging work for private employers. About 90% of the work performed was in pulpwood cutting.

The pulpwood campaign will be carried forward during the remainder of 1944, the Department of Commerce states, by the Pulpwood Division of the Forest Products Bureau, the War Activities Committee of the Pulpwood Consuming Industries, and the Periodical Publishers' Committee. It will stress the importance of quality and proper species, and encourage farmers to contact buyers before cutting and to utilize **farm hauling** equipment.

The War Manpower Commission's recruiting program for full time woods workers has been expanded and revitalized.

Paper Club to Dine November 1

The annual fall dinner of the Paper Club of New York will be held on Wednesday evening, November 1, at the Harvard Club, 27 West 44th street.

The committee has been successful in securing as our speaker, Henry J. Taylor, Scripps-Howard foreign correspondent, author of "Men in Action," and Blue Network commentator.

The committee also has been fortunate in securing the captured German film "Invasion." This is the film which the Axis leaders hoped would conceal the truth from their peoples.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1944		Corresponding Weeks—1943	
Sept. 9 (Holiday Sept. 4)	76.8	Sept. 11	74.6
Sept. 16	94.8	Sept. 18	92.2
Sept. 23	93.7	Sept. 25	92.2
Sept. 30	95.2	Oct. 2	91.7
Oct. 7 (Revised)	94.8	Oct. 9	90.9
Oct. 14	94.7	Oct. 16	90.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1943	87.2	88.9	89.5	88.7	91.4	84.8	84.3	91.0	88.3	89.6	89.6	82.0	87.8
1944	89.6	89.6	89.2	88.8	89.7	90.7	81.1	92.5	*90.1*				

COMPARATIVE YEARLY SUMMARIES

	1937	1938	1939	1940	1941	1942	1943	1944
Year to Date	85.4	70.2	80.5	86.2	95.6	92.0	88.3	*89.9*
Year Average	79.8	71.5	83.4	85.6	97.4	90.4	87.8	

*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1938	56	63	63	60	60	59	59	69	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	83	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	97	93
1944	90	96	95	96	96	96	85	96	*92*				

Week ending Sept. 9, 1944—80
Week ending Sept. 16, 1944—97
Week ending Sept. 23, 1944—96
Week ending Sept. 30, 1944—95
Week ending Oct. 7, 1944—96
Week ending Oct. 14, 1944—*96*

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

Midwest Co. Changes Name

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., October 24, 1944—The name of the Midwest Paper and Envelope Company, Marion, Ind., has been changed to Midwest Paper and Envelope Company, Inc. Company lists 20,000 shares of capital stock valued at $20 a share.

FOR *Better* RESULTS TRY WITCO'S NO. 11

WITCO CARBON BLACK NO. 11 is a dustless, cleaner carbon black that disperses readily and evenly to impart a deep, rich tone to your black papers. It is more economical... gives finer, more uniform results and may be placed directly in the beater without removal from the bag. Avail yourself of this opportunity to improve and reduce the cost of your black papers. Write for samples today.

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With this Caliper, rolls can be checked in a fraction of the time required to measure them with a micrometer or steel tape, and the mill superintendent can control accuracy by prescribing a fixed routine to be followed in checking rolls.

Farrel Calipers are light in weight and mounted on rollers, so that a finger's touch moves them along the face of the roll. Readings can be taken at any number of points and the adjustable dial turned to any angle for convenient visibility.

Knowing the desired diameter and the amount of crown, the operator can quickly check calculations against dial readings and the slightest error or variance will show up exactly.

Write for Bulletin 112 which describes Farrel Indicating Calipers in detail.

Determining accuracy of roll shape is one of the subjects discussed in the 32-page booklet, "A PRACTICAL GUIDE TO CARE OF CALENDERS AND CALENDER ROLLS." If you have not already sent for a free copy of this booklet, why not do so today? Information applies to any make of calender, roll or roll grinder. Contains no advertising.

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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Development of High Sulphidity in Kraft Cooking Liquors*

By Otto Kress[1]

Abstract

Consideration is given herein on the means for producing kraft cooking liquors of high sulphidity by the use of the waste liquor from soda base sulphite pulping of Southern woods, by the addition of sulphur in the form of sodium sulphite to caustic soda, by adding sulphur to the white liquor, by the direct addition of sulphur to the smelt produced in the kraft recovery furnace, and by the addition of sulphur dioxide to the smelter. The results of investigational projects are summarized and discussed as they pertain to practice and theory.

The advantages to be secured through the use of sodium sulphide as a constituent of an alkaline cooking liquor has been known for a great many years and, probably, was first recognized by Asahel K. Eaton and was disclosed by patents granted in 1864.

The kraft process, as we think of it today, was developed at about the turn of the present century. The tremendous growth of this industry can be realized when it is considered that practically one-half of the total pulp tonnage produced today is based upon the kraft process or a modified soda process employing some sodium sulphide in the cooking liquor.

Kraft mills maintain sulphidity of the cooking liquor through the use of sodium sulphate as the make-up chemical, which is reduced in the furnace to sodium sulphide. By the term sulphidity in this article, we have reference to the percentage found by dividing the sodium sulphide in the cooking liquor by the total titratable alkali which comprises caustic soda, sodium carbonate, and sodium sulphide, all chemicals being reduced to the basis of sodium oxide.

Assuming an average consumption of 300 pounds of salt cake per ton of pulp produced there is, in general, an efficiency in the kraft recovery system of 85%, whereas in the soda process in the better run mills it exceeds 90%. Of this 300 pounds of salt cake, or the alkali equivalent of it, the stack losses will average around 150 pounds, the absorbed alkali 20 pounds, and the wash-room and wet-room losses approximately 100 pounds; in addition, mechanical losses from leaks, etc., in the form of white liquor, black liquor, etc., may be very serious. Most of the kraft mills do not have equipment for precipitating chemicals from the stack gases, such as a Cottrell precipitator and, if such equipment is not in use, the salt cake consumption will be approximately 150 pounds per ton of pulp in the form of stack losses.

Although salt cake is the important make-up chemical in the kraft process, many mills, in order to increase sulphidity, are adding sulphur to the extent of from 12 to 50 pounds per ton of pulp, the points of addition being directly to the furnace, in admixture with concentrated black liquor which is sprayed into the furnace, or by adding the sulphur either to the green or white liquor or directly to the digester.

Niter cake has been used extensively, especially in the older mills, where dry black ash was produced which, in turn, was smelted in the old-fashioned recovery furnace. Niter cake, because of its low melting point, offers difficulty from melting and passed directly into the green liquor tank with the smelt in an unreduced condition; however, it represents a cheap source of soda and, if used correctly, tends to produce cooking liquors of high sulphidity. In view of the more modern methods used for the production of nitric acid, niter cake has become decidedly more scarce within the past few years. Niter cake, in the opinion of the writer, must be furnished dry to the furnace and never should be admixed with black liquor, because the evolution of hydrogen sulphide and carbon monoxide is extremely dangerous and several deaths have occurred through the direct addition of niter cake to black liquor.

Another important substitute for salt cake is the so-called synthetic salt cake made by fusing a mixture of sodium carbonate and sulphur in the correct proportion. It is the author's understanding that a separate paper will be given, covering the application of synthetic salt cake in the kraft industry.

Considerable laboratory work and commercial experimentation has been made in the use of gypsum to replace a part of the salt cake in the kraft recovery operation. Gypsum is reduced to calcium sulphide in the same temperature range that is required for sodium sulphate, but the rate of reduction is slower. However, the time for maximum reduction is the same in both cases.

The calcium sulphide can be converted to sodium sulphide through the use of a sufficient quantity of sodium carbonate to the furnace. The green liquor

*Presented at the TAPPI Meeting held in Savannah, Ga., October 18-20, 1944.

[1]Member TAPPI; Technical Director, The Institute of Paper Chemistry, Appleton, Wis.

can be causticized readily and the rate of settling of the sludge is the same as that of a liquor made under normal mill conditions. Gypsum should not be admixed with black liquor, but should be introduced into the furnace in the dry form.

Through the use of gypsum, liquors of higher sulphidity can be prepared than with salt cake, and the sulphidity can be raised more rapidly, if this is desirable. The economics of the use of gypsum are based on the relative costs of salt cake versus the cost of gypsum and soda ash.

The object of this paper is to stimulate discussion on means for producing high sulphidity in kraft cooking liquors. The use of much of the following data was made possible through the courtesy of the Texas Gulf Sulphur Company (Incorporated), for whom some of this work was undertaken.

Soda Base Sulphite Pulping of Southern Woods and the Utilization of the Resulting Waste Liquor as a Source of Replacement Chemical in Kraft Pulping

Many investigators have considered cooking wood by the sulphite process using a soda base, recovering the waste liquor, and evaporating and burning the concentrated liquor as a make-up chemical for the kraft operation. With the more modern systems of sulphite pulping, such as Chemipulp, it is feasible to operate a sulphite mill under warm climate conditions, because the sulphur dioxide gas is held under pressure in the cooking liquor in the accumulator. Naturally, the mill will have to be balanced so that the recovered salts derived from the sulphite process would just about balance the salt cake required as the make-up chemical in the kraft operation. By this means it would appear that either pines or hardwoods could be cooked and, although it is known that young loblolly pine (which carries a low resin content) can be cooked by the sulphite process using a lime base, it is also known that, with the soda-base cooking liquor, woods of somewhat higher resin content can be pulped.

Accordingly, a study was made in which loblolly pine (consisting mainly of sapwood and very little hardwood) was cooked and, for comparison purposes, two commercial northern sulphite pulps representing an unbleached and a bleached pulp were evaluated for strength characteristics. The cooking data are shown in Table I.

Some of this pulp was given a final hypochlorite treatment after it had been chlorinated and extracted with alkali; the final bleach to practical exhaustion requires about 5.25 hours at 40° C. The brightness of the pulp was 83.1%. A comparison of the strength data of pulp from cook 2 on loblolly pine and commercial pulps is given in Table II.

TABLE I.—COOKING, YIELD, AND PERMANGANATE NUMBER DATA
(Loblolly Pine)

Cook	1	2	3
Moisture in chips, %	53.2	53.0	52.7
Maximum temperature, °C.	140	140	140
Time to 110° C., hr.	3.0	3.0	3.5
Time from 110° C. to maximum temperature, hr.	4.0	4.0	4.0
Time at maximum, hr.	3.0	3.0	2.5
Acid concentration: Total SO_2, %	6.99	5.98	5.96
Free SO_2, %	5.78	4.78	4.77
Combined SO_2, % (sodium base)	1.21	1.20	1.19
Total pulp yield, %	47.1	47.6	48.6
Screened pulp yield, %	46.7	47.3	48.1
Screenings, %	0.85	0.66	0.93
Permanganate number	6.9	9.5	11.4

For all cooks:
Total cooking time = 10.0 hr.
Liquor ratio = 5.0 ml. per gram of moisture-free wood
Digester = No. 4 stationary (stainless steel)

TABLE II.—BEATER EVALUATION DATA
(5500 Grams on Bedplate for All Pulps)

Pulp	$KMnO_4$ No.	Brightness, %	Schopper-Riegler Freeness, ml. 5 min.	20 min.	35 min.	50 min.	65 min.	Basis Weight, lb. (25x40-500) 5 min.	20 min.	35 min.	50 min.
Cook 2, unbleached	9.5	—	855	725	520	350	225	47.2	47.0	46.0	45.9
Commercial, unbleached	14.4	—	855	755	535	335	205	46.7	46.6	48.1	48.1
Cook 2, bleached	—	83.1	875	745	500	320	200	45.8	46.7	46.6	46.2
Commercial, bleached	—	84.1	860	750	510	315	195	45.8	46.8	45.8	46.0

Pulp	Bursting Strength Pt./100 lb. 5 min.	20 min.	35 min.	50 min.	Tear Factor 5 min.	20 min.	35 min.	50 min.	Opacity Contrast Ratio 5 min.	20 min.	35 min.	50 min.
Cook 2, unbleached	63	87	95	83	1.88	1.46	1.20	0.92	—	—	—	—
Commercial, unbleached	39	84	95	90	2.55	1.30	1.09	0.97	—	—	—	—
Cook 2, bleached	59	91	94	96	2.01	1.27	1.21	0.95	61.8	49.2	38.7	35.7
Commercial, bleached	35	85	99	98	2.44	1.57	1.22	1.03	71.9	65.9	60.3	56.7

Chemical Balance Calculations

A. Sulphur Balance

Assumptions and basis for calculations:
1. A quantity of sulphite waste liquor (S.W.L.) solids is required which will supply enough sulphur to replace the losses in the kraft recovery cycle.
2. Kraft operation requires as make-up chemical 300 pounds of sodium sulphate per ton of air-dry pulp.
3. Kraft operation produces 3000 pounds of black liquor solids per ton of air-dry pulp.
4. Sulphur contained in S.W.L. solids is equivalent to *twice* the combined sulphur dioxide in the original cooking liquor.
5. Sulphite liquor specifications are as follows:
Combined SO_2, 1.20%
Liquor ratio, ml. liquor per gram moisture-free wood, 5.0
6. Yield of pulp is 45% in each process.
7. Ratio of oxygen to sulphur is unchanged in sulphite cooking, washing, and evaporation to dryness under laboratory conditions currently employed.

Sulphur required as make-up chemical per ton air-dry kraft pulp

$$300 \times \frac{32}{142} = 68 \text{ lb. sulphur}$$

Sulphur recovered in S.W.L. per ton air-dry sulphite pulp

$$5.0 \times \frac{1.20 \times 2}{100} \times \frac{32}{64} \times \frac{100}{45} \times 2000 \times \frac{90}{100} = 240 \text{ lb./ton air-dry}$$

S.W.L. solids per ton air-dry sulphite pulp

Organic

$$\frac{55}{45} \times 2000 \times \frac{90}{100} = 2200 \text{ lb./ton air-dry}$$

Inorganic = S ($NaHSO_3$/S)

$$240 \times \frac{104}{32} = 780 \text{ lb./ton air-dry}$$

Total

$2200 + 780 = 2980$ lb./ton air-dry

For convenience, use 3000 lb./ton air-dry

S.W.L. solids required per ton air-dry kraft pulp

$$68 \times \frac{3000}{240} = 850 \text{ lb.}$$

S.W.L. solids required per pound kraft black liquor solids

$$\frac{850}{3000} = 0.28 \text{ lb.}$$

Sulphite pulp per ton air-dry kraft pulp

$$0.28 \times \frac{3000}{3000} = 0.28 \text{ ton air-dry}$$

B. Sodium Balance

Sodium recovered in S.W.L. per ton air-dry sulphite pulp

$$5.0 \times \frac{1.20}{100} \times \frac{46}{64} \times \frac{100}{45} \times 2000 \times \frac{90}{100} = 172 \text{ lb./ton air-dry}$$

Sodium required as make-up per ton air-dry kraft pulp

$$300 \times \frac{46}{142} = 97 \text{ lb./ton air-dry}$$

S.W.L. solids required per ton air-dry kraft pulp

$$97 \times \frac{3000}{172} = 1690 \text{ lb.}$$

S.W.L. solids required per pound kraft black liquor solids

$$\frac{1690}{3000} = 0.56 \text{ lb.}$$

Sulphite pulp per ton air-dry kraft pulp—theoretical

$$0.56 \times \frac{3000}{3000} = 0.56 \text{ ton air-dry}$$

Assuming 90° recovery of S.W.L.

$$0.56 \times \frac{100}{90} = 0.62 \text{ ton air-dry}$$

The discrepancy between the results of the sulphur and sodium balances, respectively, suggests that there is twice as much sulphur available in the S.W.L. solids as required. This would be very favorable to the kraft mill operation, because of the higher sulphidity which would result.

In order to establish a background in the system being investigated and to determine the conditions under which precipitation could be expected, the following three semiquantitative experiments were performed:

1. Sulphite waste liquor from cook 2 containing 121 grams per liter and kraft black liquor containing 277 grams per liter were mixed in such proportions that the ratio of the respective solids was 0.6 to 1.0 in accordance with the sodium balance calculations. Upon filtering, no residue was found on the filter paper.

2. Another mixture, prepared in the same ratio, was evaporated over a steam bath and under reduced pressure to one-half its original volume. Upon filtering, there was observed a great deal of rather granular precipitate. Some of it remained on the walls of the distilling flask and could not be removed by a hot caustic treatment.

3. Portions of the kraft and of the sulphite waste liquors were evaporated separately, under reduced pressure, to approximately one-half their original volume. The evaporated liquors were mixed at 160° F. Half the mixture was filtered immediately; the other half was filtered after 25 minutes. There was a precipitate on the filter paper in each case.

The following pH data were obtained:

Kraft black liquor	11.2;	after evaporation	11.2
Sulphite waste liquor	2.8;	after evaporation	4.1
Mixture before evaporation	10.0		

It was concluded from these experiments that in any commercial operation the two liquors would need to be evaporated separately to a suitable concentration for the recovery furnace, and introduced into the furnace through separate lines. In order to determine the proportion of the sulphur that might be retained in the extreme case where the sulphite liquor would be evaporated to dryness and incinerated separately under oxidizing conditions, the following data were obtained in the laboratory, using again the sulphite waste liquor from cook 2:

On original liquor:		
	Total S, g./l.	10.38
	Total Na, g./l.	6.26
On total solids (basis: original liquor):		
	Total solids, g./l.	120.72
	Total S, g./l.	9.20
On ash (basis: original liquor):		
	Total S in ash, g./l.	4.21
	Sulphate S in ash, g./l.	4.11

Assumption 4 of the chemical balance would call for a sulphur to sodium ratio of approximately 1.4 to 1.0. Assuming no loss of sodium, the ratio existing in the total solids in this case was nearly 1.5 to 1, which is reasonably good agreement. A serious loss of sulphur occurred during incineration, but it should be possible to recover at least part of this under commercial conditions if the solids from the two sources were burned together in intimate mixture. In any event, sulphur would always be retained in the amount required to form the sodium sulphate derived from the sulphite waste liquor.

The Effect of Adding Sulphur in the Form of Sodium Sulphite to Caustic Soda in the Cooking of Kraft Pulp

It is well known from commercial practice (and the process is protected by patents) that a mixture of caustic soda and sodium sulphite will cook wood satisfactorily to produce a good quality pulp. Therefore, it was thought that it would be desirable to obtain some information on the reactions which occur from the interaction of caustic soda and sodium sulphite, both from a theoretical standpoint and from the laboratory standpoint of cooking wood. It would be reasonable to produce the sodium sulphite by the interaction of soda ash and sulphur dioxide gas (produced by the burning of sulphur) and adding this liquor as a component to the white liquor obtained from the kraft recovery. The black liquor resulting from the cook would be put through the normal recovery operation to produce essentially in the white liquor the desired constituents of caustic soda and sodium sulphide.

It was the purpose of the study to so regulate the cooking liquor through the addition of sodium sulphite that no salt cake would be required in the kraft recovery operation. A series of cooks was made on scrub pine in which somewhat less than half the sodium sulphide is a typical kraft cooking liquor was replaced by sodium sulphite, e. g., the normal base kraft cook was made using a chemical ratio of 15.0% caustic soda and 7.3% sodium sulphide per hundred weight of moisture-free wood. This produced a yield of 45.4% screened pulp and 0.6% screenings.

A typical cook using some sodium sulphite was made; the liquor contained 15% sodium hydroxide, 3.6% sodium sulphide, and 7.4% sodium sulphite and produced a yield of 45.4% screened pulp with 3.3% screenings. A series of these cooks was made varying the pulping conditions, and the resulting pulps were evaluated; they were of strength equivalent to pulps made using the base-pulping conditions described for the production of kraft pulp. Possibly the odor nuisance would be reduced by the use of the sodium sulphite-sodium sulphide combination.

The Effect of Adding Sulphur to White Liquor

Soda mills, in order to take advantage of a modified kraft cook in situations where the odor nuisance was not serious, for years have been adding sulphur directly to the green or white liquor and, more usually, to the digester. A great deal has been written concerning the fundamental chemistry and the reactions involved when sulphur is added to a caustic soda solution and it was thought advisable to study this reaction further. Accordingly, study was made of the chemistry involved in the addition of sulphur under varying conditions to white liquor and the quality of pulp produced by the modified soda liquor was compared with that obtained from normal kraft cooks.

When sulphur reacts with alkalies, the chief products of the reaction are sulphides or polysulphides and thiosulphates. In addition, small quantities of sulphates, sulphides, and polythionates are produced.

The reaction of sodium hydroxide and sulphur is

supposed to proceed according to the ideal reactions:

$$6\ NaOH + 4\ S \rightarrow 2\ Na_2S + Na_2S_2O_3 + 3\ H_2O \quad (1)$$

or with the formation of polysulphides, according to reaction (2):

$$6\ NaOH + nS \rightarrow 2\ Na_2S_{\frac{n}{2}} + Na_2S_2O_3 + 3\ H_2O. \quad (2)$$

The presence of sulphides or polysulphides and thiosulphates in the reaction products are characteristic. It has been observed that the proportion of thiosulphate in the reaction mixture is sometimes more than that required by the above equation.

The intermediate steps of the reaction leading to the formation of thiosulphate are unknown and a number of possible reaction mechanisms have been suggested. Among these is the proposal that, in the primary reaction, sodium sulphide and sodium sulphoxylate are formed according to the reaction:

$$4\ NaOH + 2\ S \rightarrow Na_2S + Na_2SO_2 + 2\ H_2O \quad (3)$$

and that the sulphoxylate is converted to sodium thiosulphate by subsequent reactions.

The reaction was carried out under four series of conditions:

Series 1—Varying quantities of sulphur at 100° C.
Series 2—Varying quantities of sulphur at a pressure of 100 pounds per square inch and 170° C.
Series 3—Varying times from 0.25 to 4 hours at 100° C.
Series 4—Var ing times from 0.25 to 4 hours at a pressure of 130 pounds per square inch and 180° C.

The general accepted idea that the reaction proceeds according to the equation —— $6\ NaOH + 4\ S = 2\ Na_2S + Na_2S_2O_3 + 3\ H_2O$ —— has been shown to be incorrect. The proportion of sodium thiosulphate obtained in generally greater than indicated by this equation.

In each series of experiments, sodium sulphide and sodium thiosulphate were the chief products formed. Polysulphides, sulphites, and sulphates were present in relatively smaller amounts.

The various series of experiments may be briefly summarized as follows:

Series 1: Both sulphide and thiosulphate increased regularly with increase in sulphur introduced. The ratio of sulphide to thiosulphate increased with increasing amounts of sulphur introduced.

Series 2: Both sulphide and thiosulphate increased regularly with increase in sulphur introduced. There was no progressive change in ratio of sulphide to thiosulphate with increasing amounts of sulphur.

Series 3: Both sulphide and thiosulphate increased regularly with time. The ratio of sulphide to thiosulphate decreased with increasing time.

Series 4: There was no change in sulphide and thiosulphate content after the minimum period used (0.25 hour). The ratio of sulphide to thiosulphate was not affected in any of the experiments (time periods up to 4 hours).

Sulphur and sodium hydroxide balances were calculated for each cook. In many cases the calculated recovery was considerably in excess of the amounts originally added. This fact, in conjunction with the failure of the sulphide-thiosulphate ratio to follow the predicted equation, indicates that some unknown factor influences the reaction and, therefore, the results to a considerable degree.

The suggestion previously made in the literature that the primary reaction is represented by: $4\ NaOH + 2\ S \rightarrow Na_2S + Na_2SO_2 + 2\ H_2O$ and that this is followed by a second reaction in which the Na_2SO_2 (sodium sulphoxylate) is converted to thiosulphate, has been examined in view of the data obtained; many of the apparent discrepancies observed may be explained by assuming that the products of reaction include Na_2SO_2.

At 100° C. a maximum sulphidity of 73.0 grams per liter Na_2S was obtained with 120.0 grams of sulphur and 110.5 grams of sodium hydroxide per liter for 0.5 hour. A maximum ratio of sulphidity to sulphur added was obtained with 9.38 grams of sulphur and 55.4 grams of sodium hydroxide per liter for 4 hours. A maximum ratio of sulphide to thiosulphate was obtained with 9.38 grams of sulphur and 55.4 grams of sodium hydroxide per liter for 0.25 hour.

At 100 to 130 pounds per square inch pressure and 170 to 180° C., a maximum sulphidity was obtained with 120 grams of sulphur and 11.3 grams of sodium hydroxide per liter for 0.5 hour. A maximum ratio of sulphidity to sulphur added was obtained with 24.0 grams of sulphur and 114.0 grams of sodium hydroxide per liter for 0.5 hour. A maximum ratio of sulphide to thiosulphate was obtained with 17.2 grams of sulphur per liter and 114.0 grams of sodium hydroxide per liter for 0.5 hour.

A comparison of the results obtained at 100° with those at 170 to 180°, show that the liquors produced at higher temperatures are of much higher sulphidities and much higher ratios of sulphidity to sulphur added. The ratio of sulphide to thiosulphate appeared to be more affected by the time of reaction and the proportions of the reactants than by temperature and pressure.

Study of the Reaction of Sodium Thiosulphate With Sodium Hydroxide in the Absence and Presence of Wood

As sodium thiosulphate is produced by the interaction of caustic soda and sulphur, it was thought advisable to study this reaction further and the reaction of such relatively minor amounts of thiosulphate upon the quality of the pulp produced. It is well known that sodium thiosulphate, when used alone in large amounts (up to 50 to 60% of the weight of the wood) will pulp wood, producing an almost black pulp of reasonable strength. The essential conclusions drawn from this study are as follows:

1. There is no appreciable reaction between sodium thiosulphate and sodium hydroxide when heated for 1 hour at 100° C. or at 170° C. Under none of the conditions of concentration employed in the experimental work was the sodium thiosulphate decomposed, and the entire amount originally introduced is present in the resulting liquor.

2. The following suggested reaction —— $Na_2S_2O_3 + 2\ NaOH \rightarrow Na_2SO_4 + Na_2S + H_2O$ —— does not proceed in the presence of wood under cooking conditions similar to commercial practice. The thiosulphate does not enter into the pulping action and appears to be without effect. Only small quantities of sulphide and sulphate remain in the black liquor.

The Direct Addition of Sulphur to Smelt Produced in Kraft Recovery Furnace

Those mills operating by the kraft process, in which high sulphidity in the cooking liquor is desired, may find it necessary to add elementary sulphur to maintain such high sulphidity. In the old-fashioned recovery process, such sulphur may be admixed with the black ash or introduced at intervals in the solid form into the furnace. Mills using spray furnaces

add the sulphur either by introducing it at intervals on top of the fuel bed or admixing it with the concentrated black liquor and spraying the resulting mixture into the furnace. If the sulphur is introduced into the black liquor by spraying, much of the sulphur is lost as the water evaporates and partial distillation of the falling particles of solid black ash occurs, as is the case in any method of introducing sulphur into the furnace directly, through the failure of the sulphur dioxide to combine with the alkali of the black liquor solids. Therefore, it was thought advisable to study the direct interaction of sulphur and molten soda ash to determine what advantage might be secured by introducing the sulphur so that it would come into direct contact with the smelt. These experiments were conducted on a laboratory scale only and indicate that, when sulphur is introduced into molten sodium carbonate, approximately one-half appears as sodium sulphide and that, when an excess of reducing material is present, the proportion of sulphur appearing as sodium sulphide is very materially increased.

Raising the Sulphidity of Smelt by the Addition of Sulphur Dioxide to the Smelter

In order to avoid the loss of sulphur incident to introducing it in the elementary form into the recovery furnace where it is exposed to a large excess of air and where poor contact is secured with the alkali in the black liquor, it was thought that it might be advisable to attempt the introduction of the sulphur directly above the smelt in the furnace.

The experiment consisted of introducing sulphur dioxide gas through one of the air nozzles of an old-fashioned kraft recovery furnace. By determining the volume of green and white liquors produced and analysing these liquors when the furnace was operating normally and during the period when the sulphur dioxide was introduced, it was hoped that the advantages of introducing sulphur directly into the bottom of the furnace where it would have an opportunity to combine with the alkali might be determined.

From a theoretical standpoint, it would be better to introduce molten sulphur than sulphur dioxide, because the sulphur is in a lower reduced form. Molten sulphur was not used for this trial because of the difficulties of keeping it in a molten state for an experimental trial of this kind.

Although only two-thirds of the sulphur dioxide added was obtained in the form of sodium sulphide, the total amount was accounted for as sodium sulphide, sodium sulphate, and sodium sulphite. This is much better than the present practice of adding sulphur to the smelt but no better than adding it to the digester. In each case the sulphur compounds of sodium not in the form of sodium sulphide will be reduced to the sulphide the next time the spent cooking liquors pass through the recovery system with a loss of soda base in accordance with the recovery process used.

It should be mentioned that the sulphur dioxide was added with the air in order to avoid expensive alteration of the smelters. It is reasonable to predict that, had it been added a foot or two above the level at which the air entered the smelting zone and through one of the sides in which there were no air tuyères, a much larger proportion of sodium sulphide probably would have resulted.

The above disjointed remarks on some work which has been done in the hope of maintaining the desirable high sulphidity in kraft cooking liquor are given solely for the purpose of presenting some data for discussion at this meeting.

Acknowledgment

For most of this work the writer is indebted to the Texas Gulf Sulphur Company (Incorporated) for permission to use a small amount of the data which were developed at the Institute in a cooperative study for this company.

Chemistry and Manufacture of Starch

The Academic Press has recently published an interesting 472 page book entitled "Chemistry and Industry of Starch, Starch Sugars and Related Compounds" by Ralph W. Kerr of the Corn Products Refining Company. Like many industrial texts published during the past few years this book of 22 chapters is written by Dr. Kerr and 14 co-authors representing several colleges and such companies as Stein, Hall, The Clinton Company and the General Foods Corporation. The purpose of the book is to review and bring up to date the accumulated knowledge of starch and products derived therefrom.

Subjects covered include the manufacture of corn, tapioca, wheat, potato and other industrial starches, evaluation of modified starches, physical and chemical properties, oxidation and dextrination and acid hydrolysis of starch, modification of starches by enzymes, and the applications of starch to paper manufacture, foods, fermentation industries, textiles and adhesives. The section on starch in papermaking covers beater, calender, tub and surface sizing and clay coatings. Excellent bibliographies accompany each chapter.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd street, New York 17, N. Y. at $8.50 per copy.

Automatic Control Engineering

More than 20 years' experience in the development of metering and automatic control mechanisms is concentrated in a new McGraw-Hill book by Ed. Sinclair Smith, formerly engineer in charge of patents for C. J. Tagliabue Mfg. Co., entitled Automatic Control Engineering (370 pp.). In preparing this book the author's purpose is to provide the reader with tools designed to assist him in solving problems in automatic regulation wherever they may occur. The approach is a fundamental one not specific to any particular plants or processes.

Very little attention is given to formulas. Instead, the author's object is to teach the reader to understand and think out his problems. Fully half of the book consists of appendices, tabular material, review of the fundamental physics required, bibliography and tried and successful analytical methods for the solution of differential equations. Advance in control should be possible for those who will seriously apply themselves, even with the probably rusty and generally inadequate mathematical background possessed by most engineers.

Copies may be obtained from the Book Department of the Technical Association of the Pulp and Paper Industry, 122 E. 42nd street, New York 17, N. Y., at $4.00 per copy.

Nonfibrous Raw Materials Committee Report for the Year 1943*

By E. N. Poor[1]

The past year perhaps was the most momentous one in the history of the pulp and paper industry—a year that placed wood pulp and its products on a par with the critical materials of our war effort. And like other critical materials, strict regulations were imposed by the Federal Government to assure an adequate supply for military demands. The growing manpower shortage decreased the amount of wood available for pulp manufacture and pulp allocation made imperative the production of secondary fiber. To further extend the diminishing supply of pulp, many grades of paper were limited as to basis weight, number of colors, and item tonnages.

These changes were necessarily reflected in the consumption of chemicals and their availability became increasingly dependent on the immediate military demands.

Caustic Soda

Regarding caustic soda, the conditions affecting availability and probable effect of the war during the coming year, it is believed that caustic will be short in 1944. Part of this shortage will be caused by a large demand from the rayon industry for the production of high tenacity rayon cord for use in automobile tires. The caustic for this use will carry a high preference rating and such orders will have to be filled. At the present there is no sign of let up in the demand for caustic soda in other fields.

In regard to possible substitutes, nothing is known that can be used as a substitute for caustic soda. While it is true that lime can be used to a limited extent for caustic neutralization following the chlorination of pulp, lime is not suitable for caustic as a pulping or deinking agent.

The increasing demand for the use of waste paper by the paper mills will undoubtedly increase the consumption of caustic by the paper industry.

Since the price of caustic soda has remained fairly constant for the last few years, it is not believed that this material will increase the price. The quality of caustic is not to be lowered.

Lime

During 1943 one of the heaviest demands for lime was experienced by the lime manufacturers. It is remarkable to note that many times during 1943 the available or free lime in the United States was at zero, and at no time did a manufacturer have to shut down his plant for the want of lime. This splendid record in the lime industry is the direct result of close co-operation between the supplier and consumer. It is generally felt at this time, that the peak demand for chemical lime has passed.

Prices on lime were firm during 1943 and will remain so during 1944, with a fairly steady demand for bulk and packaged chemical lime. With labor, taxes, and coal costs going up there should be an improvement upward in lime prices during this coming year.

Lime plays an important part in the war production program such as in the manufacture of paperboard, bags, Neoprene, medical supplies, steel and many other products. It is also used in purifying the water used in many of our Army camps throughout the country.

The ODT now permits minimum package lime loading at 60,000 pounds; bulk lime 80,000 pounds.

Chlorine

Conditions affecting availability and probable effect of the war during the coming year: On the basis of chlorine distribution during 1943 the production of chlorine at certain government arsenals, increased capacity at privately owned chlorine plants, and the limitation of the use of chlorine by the pulp industry—it would appear that the merchant chlorine industry can fill the chlorine requirements of the pulp and paper industry for 1944—however, this is all subject to government requirements and those requirements for 1944 are not known.

As was the case in 1943—there appears to be no substitute for chlorine as a bleaching agent for the pulp and paper industry.

During 1943 there appeared to be few if any variations in the bulk price of chlorine—while the price situation for 1944 cannot be predicted there would seem to be no indication of any radical price change.

The purity of commercial chlorine continues to be of a higher order, virtually 100% pure.

As reported in 1942 there are some new uses for chlorine outside of the pulp and paper industry but they cannot be put into practice unless it can be proven they are essential to national defense or sanitation—most will have to wait until the war is over.

Soda Ash

Soda ash (sodium carbonate) consumption during the past year exceeded in total tonnage any previous year, and alkali plant operation was maintained at maximum capacity. The full effect of the accelerated war program was evident, and the market during the last six months of 1943 was tight and deliveries restricted. Forecast for 1944 is probable easing of the war industry demand due to military needs of strategic metals and explosives having been met. This favorable war material position may relax alkali demand so that more soda ash will be available for less critical industries.

Soda ash continues to be cheapest and most readily used form of alkali for pulp manufacture. Its use in deinking waste papers involved substantial tonnages in 1943 and it is likely that the 1944 program for reuse of salvaged paper will entail increased soda ash consumptions. Availability of salt cake and

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chemical byproducts of equivalent value may modify the previous demand from kraft mills for excessive quantities of soda ash in liquor recovery makeup. The curtailed operations due to wood shortage in 1943 resulted in lesser demand for kraft recovery chemicals and this condition will probably persist in 1944.

The chemical purity of soda ash has been maintained under war time conditions and it is very improbable that the uniform quality of this material will vary from the high standards of past years. Despite substantial increases in alkali manufacturing costs, the price of soda ash f.o.b. chemical plant has been maintained at pre-war levels.

Salt Cake

The supply of salt cake was adequate to meet the needs of the pulp industry and was balanced with demand. Price was firm throughout the year. No changes of quality occurred.

Sulphur

The war has not affected the available supply of sulphur and it is not anticipated at this time, even though shipments are the heaviest in the history of the industry.

No substitutes are necessary and none have been proposed.

The consumption of sulphur by the paper industry in the United States and Canada this year is on a par with the consumption in 1942.

There has been no change in the price schedule during the past few years.

Sulphur available to the paper industry from the Gulf Coast producers continues to be of the same uniform high quality as in past years. The crude sulphur contains more than 99.5% pure sulphur and is commercially free of arsenic and selenium.

No new uses of any magnitude have been reported in the paper industry.

Sulphur Dioxide

It is expected that sufficient liquid sulphur dioxide will be available in 1944 to cover all requirements of the paper industry, and that there will be no lack of containers in which to transport this commodity. The present high quality will be maintained, and to date there is no indication of a material variation in the price in 1944 from the exsting schedule.

As long as the allowable brightness of bleached pulp remains relatively low, the consumption of liquid sulphur dioxide in bleaching operations is likely to remain fairly constant. On the other hand an increased use of liquid sulphur dioxide for fortifying cooking acid and for supplementing burner capacity in sulphite mills is anticipated for 1944 as other unusual operating conditions require attention to these details.

Rosin

This report, for the year 1942 placed rosin in a very unique position, in relation to many of our important raw materials, in that there existed an over supply. The reverse is true at the close of 1943. Reserve stocks have been greatly reduced and much of the 1943 production has gone directly into consuming channels thus leaving considerably less of this commodity to go into carry-over stocks.

For the first time in years, a definite shortage appears to be approaching. There are several reasons for this situation. Production declined during 1943, while consumption has continued at a high level. The predicted labor shortage contributed materially to the smaller 1943 crop as did the shortage of trucks, tires, etc. Our war effort, apart from the rosin used directly in papermaking, drew heavily on this commodity for a varied number of new uses; some in themselves small but contributed to the general increased use of rosin.

Present indications point to a very small production in 1944 with further decline in stocks. It appears certain that there will be marked scarcities of several grades of rosin during the present year, undoubtedly including grade "G" which is generally considered to be the grade in greatest demand by the paper industry. Fortunately, the industry can use the slightly paler grades, although more expensive grades; such as I. K, and M, which are customarily more plentiful. However, other industries will also turn to those grades and an overall shortage of rosin appears quite probable before the end of 1944.

While other materials have been and are being used in specialty papers and boards, there are no adequate substitutes for rosin, in the broader sense, in the sizing of paper.

Consumption of rosin in paper manufacture was at a high level during 1943. Increased quantities were used in certain grades to meet the myriad demands for specialty papers for packaging food products, materials, and small machinery parts for export to our armed forces and our allies as well as replacing other types of packages for home consumption.

There was no ceiling price on gum rosin during 1943 (although ceiling prices were in effect on rosin size). Prices of rosin advanced during 1943 and are expected to advance materially during 1944, unless ceilings are imposed. Thus far, ceilings have been avoided on gum rosin to encourage greater production of a commodity, the supply of which is expected to be inadequate in future months.

Due to Government grading and to customary producing practice, the quality has not deteriorated, but rather improved in some respects.

While not in itself a new use, Government orders have brought about a material increase in the use of rosin in soap, and other industries have turned to rosin in the absence of more critical material. These added uses coupled with the above circumstances point to continued demand and make a future shortage more probable.

Casein

The supply demand relationship of casein became increasingly critical during the past year, and at this time conditions presage a world shortage. The F.E.A. is planning to purchase all surplus Argentine product in an effort to control the acute situation.

Alum

Commercial Alum

There has been considerable improvement in the quality of the war grade alum manufactured from unrestricted bauxite during the past year in that the insoluble content has been reduced with a corresponding increase in alumina content. The analysis of war grade alum varies somewhat between different manufacturers in respect to alumina, insoluble, and iron content due to variations in the particular unrestricted bauxite being used. In general the mills who normally used commercial alum have found the present war grades of alum satisfactory. The indica-

tions are that the quality of war alum will continue to improve during the coming year approaching that of pre-war alum.

The demand for alum by the paper industry during the past year has been at a high level and alum production capacity has been heavily taxed to take care of the requirements. Since many of the early difficulties experienced in adapting low grade bauxite to the manufacture of alum have been overcome, the supply of alum should be somewhat improved this year. There has been no change in the schedule price of commercial alum during the past year and no change is anticipated during the coming year.

Iron-free Alum

The production of iron-free alum from unrestricted bauxite has not progressed as well as anticipated a year ago and there has been very little iron-free alum available to the paper industry during the past year except for a very limited amount of a war grade iron-free alum. Since there has been considerable work done on the utilization of available raw materials for the production of iron-free alum, there are some indications that there will be more available this year although the amount is uncertain.

Sodium Aluminate

There has been practically no aluminum hydrate allocated for the production of sodium aluminate for use in the manufacture of paper during the past year. The sodium aluminate requirements of the paper industry have been partially satisfied by an available crude sodium phospho aluminate, a limited quantity of which has been available. Some mills have been able to use caustic soda in place of sodium aluminate although this has not been too satisfactory. Another war grade sodium aluminate designated as sodium aluminate BC, has been recently made available to the paper industry in limited quantities and appears to be suitable for all applications in the manufacture of paper.

Indications are that the availability of the above alternates for pre-war paper making grades of sodium aluminate should more adequately take care of the requirements of the paper industry during the coming year.

The prices of these war grades of sodium aluminate are similar to pre-war sodium aluminate prices.

Glue

A combination of shortages of raw materials and labor for the production of animal glue, has reduced the supply to a point that all essential requirements cannot be met in their entirety.

The glue industry, in co-operation with the Adhesive Section of WPB is making every effort to increase production, both through obtaining additional raw materials from foreign sources and endeavoring to correct the labor problem.

In the meantime, WPB has elected to put glue under a Limitation Order, which allows the paper manufacturers a favorable percentage of their glue requirements., At the present time, the prospects of increased production are not apparent enough to forecast an early increased allotment for the paper manufacturers. It is believed, however, the glue industry can maintain the present volume of production and the allotment should not be decreased. Should production improve, which is quite possible, the essential end uses of glue by paper manufacturers will surely entitle the paper industry to participate in a fair share of any additional glue that becomes available.

Starch

The volume available to the paper industry during 1944 will be about the same as that for 1943. However, because of the increase in the ceiling on corn, the fate of the Administration Subsidy program will be a decisive factor on where the corn moves; that is to feeders, hog raisers, or to the industrial consumers. The lend lease requirements will materially affect the overall picture. In some quarters it is felt that the end of the European phase of the war may step up food demands to the point where a tight situation may develop. On the other hand, the curtailment of printing and publishing papers will decrease the overall need for starch by the industry.

There is some tapioca flour available over and above the essential needs, as determined by the M-333 order. If WPB broadens the order to include the use of the surplus for paper, this could substitute in some parts of the paper industry. Potato starch, though somewhat high in price, domestically produced, will also be available. In addition for substitution of starch in certain paper mill uses, specially treated cereal flours have been used satisfactorily. The costs of these materials, however, have now reached a price which do not make them an economic factor. They probably would not be used to any extent unless a very tight situation should develop. No variations on price or quality are anticipated for 1944.

Enzymes

Although the trend is very definitely toward greater use of enzyme converted starches for all types of starch applications in the paper industry, it is believed that the supply of enzymes will be sufficient to meet all demands. There will probably be no price changes and no major changes in the quality of amylolytic enzymes during 1944.

Sodium Silicate

Raw materials were available in quantities sufficient to satisfy all demands for sodium silicate during the year of 1943. The supply of liquid sodium silicate during 1944 should meet all demands from present users. The question of substitutes for sodium silicate has not arisen.

Prices for the various grades of sodium silicate continued very stable during the past year and similar stability is anticipated during the coming period.

Plant conditions during the past year permitted full continuance of routine plant control and maintenance of the usual standards of product quality. There seems no reason to establish other specifications.

There has been a revival of interest in its use as a furnish reinforcement of certain low grade waste materials due to its ready availability and low cost. Sodium metasilicate has been used with other chemicals as beater furnish to satisfactorily deink certain grades of waste paper.

Its consumption has also been greatly expanded in other fields, outstanding being its increased use in gel manufacture for certain catalytic processes. Further increased consumption in this field is anticipated during the coming year and plans to adequately supply this demand have been completed.

Clay

Shipments remained steady during the year of 1943 and in sufficient tonnage to well supply the entire trade.

As far as 1944 is concerned, at the present time, indications are that there will be no curtailment of shipping space. There has been no substitution of other materials for clay during the past year—in fact some new users of English clays have been secured. The prices are still on the March 1942 ceiling. Quality has been maintained.

Zinc Sulphide Pigments

The shortage existing in paper fiber, and the consequent tendency to use lighter weights while maintaining opacity, has increased the number of those desiring to use zinc sulphide pigments. However, the war has caused a great demand for zinc sulphide pigments for numerous other products connected with the prosecution of the war, and at the moment some of the zinc sulphide pigments are not available. In this classification can be mentioned technically pure zinc sulphide, and cryptone (containing approximately 50% zinc sulphide).

Lithopone is available to the paper industry, and paper manufacturers are again finding it of interest, where a high degree of whiteness, brightness, and opacity is desired.

There were no new uses during the past year to report, nor was there any variation in the quality or the price of zinc sulphide pigments.

Titanium Pigments

There are many conditions which affect the availability of titanium pigments. Those of most importance are sulphuric acid and ilmenite ore. Production could be increased if a larger quantity of acid were available. It is believed that during 1944 these situations will be remedied to some extent; and by May of next year the titanium situation will become easier, and perhaps demands may be filled. The demand will probably remain in excess of production for the next four or five months, the remainder of next year depending almost entirely on the outcome of the war in Europe. It is quite apparent that a large demand for military uses will continue throughout 1944, but with the end of the war in Europe this demand would be curtailed to some extent. Titanium pigments will probably remain tight for the first half of 1944 and, depending on the war condition, might be freely available for the last half.

Satisfactory substitutes for titanium pigments in the paper industry are not known.

The paper industry in 1943 has very materially increased its demand for titanium pigments as compared to previous years—probably to the extent of 300%.

Titanium pigments are under an OPA ruling price. There has been no change in price during 1943, and none is expected during the coming year.

In spite of all the handicaps the manufacturers have been able to maintain the quality of the pigments with the minimum of variation.

There have been no new uses unless the pigmentation of magazine stock is classed as a new use.

At the present time the manufacturers are operating under WPB Conservation Order M-353, which controls the distribution of titanium pigments.

Plasticizers

Glycerine

The supply appears to have improved although still remaining short of the demand. As of January 1st, 1944, glycerine will be controlled by a limitation order rather than the allocation order previously in effect. Group A users (makers of strictly essential products) are given unlimited supplies. Group B users (makers of less essential products) receive, in a calendar quarter, 100% of their consumption during the corresponding quarter of 1940. In addition to the above, any person may use 3500 pounds, quarterly in Group B products without specific authorization.

Glycols

Ethylene glycol requests granted in full for December. Prices somewhat below those of a year ago.

Diethylene glycol requests for general plasticizing use were cut to 50%. Prices somewhat lower.

Triethylene glycol requests denied except for small orders (two drums). No price change.

Propylene glycol requests granted in full.

Invert Sugar

No very optimistic prediction as to easing of restrictions can be made. Industrial users were required by OPA to reregister at local boards and quota periods are revised to coincide with calendar quarters in 1944. Allotment for first quarters of 1944 is 80% of base period consumption. No price changes.

Corn Sugar and Syrup

The producers are reported able to supply consumers with a fair proportion of their 1941 consumption. Consumers without such standing may be having difficulty in getting regular supplies. Little change in prices.

Sorbitol

December requests were granted in full. Requests for technical sorbitol syrup for plasticizing uses denied. No price changes.

New Products

Of the new plasticizers offered to the trade, the most interesting is described as an invert sugar syrup containing urea. The product received some investigation and some favorable results have been reported. Supplies of this plasticizer are apt to be uncertain since both components are subject to allocation. December requests for urea were granted in full for essential uses only. In general, the rest of the new plasticizers offered have been unidentified except by trade marks. Not much is known of their composition and no particular success has been reported by mills attempting to evaluate them.

Synthetic Resins

The use of synthetic resins for the modification of fibrous and nonfibrous papermaking materials received widespread attention in the paper industry during 1943. Of the various resins considered, water soluble, thermosetting, urea, phenol, and melamine-formaldehyde have been of greatest interest, and very sizeable quantities of these three types are now being used for numerous important applications. Urea formaldehyde resin, which may be applied effectively

by both tub and beater treatment, is being used widely for improving dry and wet strength characteristics.

Other uses for urea formaldehyde in the paper field include the waterproofing of solid paper and corrugated board adhesives and, to limited extent, laminating varnishes. Phenol formaldehyde resins have been of interest primarily in the production of low pressure paper-base laminates. Melamine formaldehyde resins, properly prepared before use, are of interest in the production of wet strength papers. These resins have contributed substantially to the war effort in the manufacture of paper bags, wiping tissues, map paper, towels, etc.

Improvement in Availability

A few other synthetic types have been considered to a limited extent in laboratory study, but the three thermosetting resins noted above are developments now in commercial practice. Refinements have been made on the application of these resins so that in most cases, it has been possible to reduce consumption while maintaining a standard degree of wet strength. At first disposal of wet strength treated broke was a baffling problem but most users are now reclaiming the broke in standard equipment. Synthetic resins, as a class, have undergone slight reductions in price during 1943. Markedly increased production facilities have effected a rather general improvement in availability although, for the most part, they are restricted still to use in war outlets and essential civilian applications.

Dyestuffs

The supply of dyes for the coming year will of course depend on the availability of raw materials. Dyes are manufactured from coal tar crudes and other highly critical materials, some of which may not always be readily available. It is believed however that there will be sufficient of the essential raw materials to enable the dyestuff producers to manufacture enough to supply the curtailed requirements of the paper industry.

If some dyes are not available and substitutions are necessary, it is quite certain that the variety of dyes and pigments which will be available will be sufficient to produce almost any shade desired. However, each case will be a problem in itself and will have to be worked out as the situation arises.

Consumption by Paper Industry

The consumption of dyes by the paper industry during 1943 was approximately the same as in 1942. However, the restrictions recently imposed on the sale of colored papers will lower the requirements for the coming year.

Selling Prices

Selling prices as of March, 1942 are still in effect. In general, standards have been maintained even though the producers have had difficulty obtaining some raw materials. In the few instances that changes were necessary, consumers were advised and the new standards found to be satisfactory in quality.

No new uses of importance have occurred during the year.

Wax Sizes

Consumption of wax sizes used in the manufacture of paper and paperboard has at least held its own during the past year. While there has been little activity on the part of paper mills in the development of special grades of paper requiring wax sizes, the staple paper products have required the full volume in spite of decreased production in some quarters because of the shortage of wood pulp. New developments in the manufacture of emulsions have been mostly in the way of improvement of existing products. One instance is the modification of wax sizes used for calender and tube applications so as to render the paper less slippery. Although some grades of wax have been very scarce, the supply of suitable types of emulsification has been sufficient. The issuance of Allocation Order M-195, later superseded by PDO-19, placing microcrystalline waxes under allocation, has necessitated the substitution of less critical grades in the manufacture of wax sizes, but no hardship has been experienced thereby. The year closed with a tendency for waxes in general to become more plentiful. Much interest has centered about unemulsified waxes for laminating and coating, particularly the amorphous petroleum types. The demand for waterproof packages for overseas shipping has placed such a demand on waxes that are not too soft when sent into the torrid zone and yet not too brittle in cold climates, that serious shortages have developed. This has brought forth increased production of microcrystalline waxes on the part of refiners and the development of extenders to stretch the available supply as far as possible. Manufacturers have met the demand in characteristic American fashion and for the most part requirements have been filled. New products have been developed for laminating paper that have not hitherto been considered useful for the purpose, and developments along this line are continuing. While certain types of amorphous waxes have been subject to allocation since July 1, 1942, and have been very scarce up to the present, other grades suitable for the same purpose have remained in ample supply.

No Market Fluctuation

Because of control of prices by the Office of Price Administration and because of the heavy demand, there has been no market fluctuation in petroleum waxes of either the paraffine or amorphous types.

Contributors to Report

Alum and Sodium Aluminate—H. E. Duston, Monsanto Chemical Company, Boston, Mass.
Caustic Soda—R. L. Carr, Mathieson Alkali Works, 60 E. 42nd Street, New York City.
Chlorine—W. S. Jacobs, Electro Bleaching Gas Company, 60 E. 42nd Street, New York City.
Clay—V. B. Case, Paper Makers Importing Company, Easton, Pa.; G. J. Lane, Edgar Bros., Metuchen, N. J.
Dyestuffs—G. F. Schaumann, E. I. du Pont & Co., Wilmington, Del.
Enzymes—F. H. Denham, R. T. Vanderbilt Co., New York.
Resins—P. B. Taft, Resinous Products Company, Philadelphia, Pa.; R. W. Kumler, American Cyanamid and Chemical Corporation, 30 Rockefeller Plaza, New York City.
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Plasticizers—N. R. Pike, The Numoline Company, 120 Wall Street, New York City.
Rosin-Casein—J. C. Deffenderfer, Hercules Powder Company, Wilmington, Del.
Salt Cake—A. E. Griffin, American Cyanamid and Chemical Company, 401 N. Broad Street, Philadelphia, Pa.
Soda Ash—M. W. Phelps, Solvay Process Company, Syracuse, N. Y.
Sodium Silicate—R. L. Kreyling, Philadelphia Quartz Company, 121 S. 3rd Street, Philadelphia, Pa.
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Sulphur Dioxide—F. G. Calkin, Virginia Smelting Company, West Norfolk, Va.
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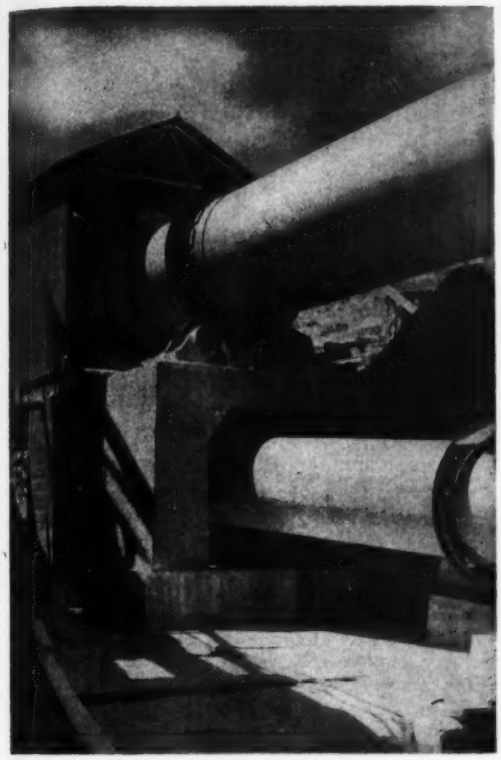

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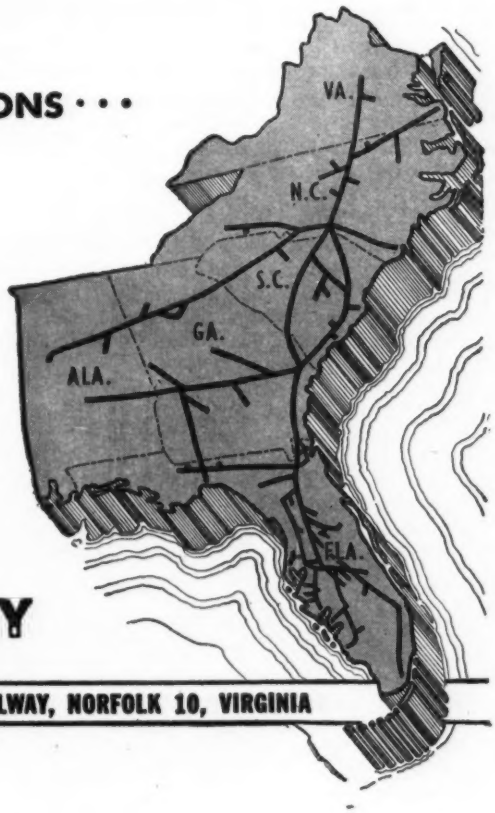


SEABOARD RAILWAY

Write

DALLAS T. DAILY, GENERAL INDUSTRIAL AGENT, SEABOARD RAILWAY, NORFOLK 10, VIRGINIA

New York Paper and Pulp Market Review

Paper Supply Situation Likely To Remain Tight For Many Months —A Little More Pulp For Book and Groundwood Paper Allocated In Current Quarter — Many Mills Want More Paper Stock.

Office of the PAPER TRADE JOURNAL,
Wednesday, October 25, 1944.

No relief from the current tight paper supply situation appears practicable until the end of the European war. Military authorities have explained that as our supply lines lengthen more supply centers must be established and larger quantities of all kinds of goods must be held in reserve. Current reports from most of many manufacturers' representatives, jobbers, and general paper merchants, reflect anxiety at their inability to meet their customers' requirements. Production of paper continues high but both military and civilian requirements are the heaviest on record. Paper is being used in more forms and in larger quantity today than ever before and demand is in excess of production.

The index of general business activity for the week ended October 14 rose to 135.9, from 135.5 for the previous week, compared with 137.8 for the corresponding week last year. The index of paper board production was 140.7, compared with 134.8 for the previous week, and with 134.8 for the corresponding week last year.

Paper production for the week ended October 14 was estimated at 94.7%, compared with 90.2% for 1943, with 89.6% for 1942, with 105.5% for 1941, and with 84.5% for the corresponding week for 1940.

Paper board production for the week ended October 14 was 96.0%, compared with 95.0% for 1943, with 79.0% for 1942, with 98.0% for 1941, and with 78.0% for the corresponding week for 1940.

Among the recent OPA amendments is the restoration of the pricing unit in effect by coarse paper merchants from October 1 to October 15, 1941, inclusive, on paper napkins sold in bulk. This will increase the prices for industrial and commercial users. This refers to Amendment No. 5 to MPR-349.

Amendment No. 11 to MPR-266 states that, where ceiling prices are granted producers of toilet tissue and paper towels, the exact amount may be passed on to the public by each subsequent seller. This will bring the margins of wholesalers or retailers above prices in the pre-war years.

Wood Pulp

Wood pulp allocations for the fourth quarter total a minimum 2,660,000 tons, of which 2,030,000 tons is for paper, 2,328,000 tons for paper board, and 212 tons for non-paper uses. This compares with a total of 2,609,000 tons in the third quarter, with 2,654,000 tons in the second quarter, and with 2,608,000 tons in the first quarter of 1944.

More pulp is authorized for book and groundwood printing papers, for fine and for an increase in shipping sack paper.

Amendment No. 1 to Revised MPR-114, effective October 28, 1944, provides a method for producers to determine their maximum prices on semi-chemical wood pulp. A sworn statement of grades and proprosed selling prices, like that required for other special grades of pulp, must be submitted to the national office of the OPA in Washington.

Rags

Demand for new cotton cuttings is active under good volume buying by paper mills at this date. All grades of new rags are reported active. Prices are firm at ceiling levels.

Buying of old cotton rags has been active this week. Reports indicate that old white and blues are in good demand. Roofing grades are in steady demand, with orders aggregating less volume than in the past few weeks. Prices are firm at ceiling levels.

Old Rope and Bagging

Demand for Manila and other major fibers is active. Owing to the lack of labor for sorting, the quantity of mixed strings is increasing. Prices are firm at ceiling levels.

Trading in scrap bagging has declined a little from the low level of last week. Supplies are reported still limited, but buyers show little interest in scrap bagging and only a very moderate desire for gunny. Prices are soft and nominal.

Old Waste Paper

The goal set for the 8,000,000 tons total of waste paper for this year is about 641,000 tons short, the Department of Commerce reports. Receipts for the first 8 months of 1944 totaled 5.640,000 tons, compared with 4,712,000 tons in 1943; consumption, 5,580,000 tons, compared with 4,959,000 tons in 1943; and inventories, 793,000 tons, compared with 550,000 tons in 1943.

Mill requirements for paper stock in the Eastern states are reported not met at this date. Demand for all grades is active, with many board mills in urgent need of immediate supplies. Prices are firm at ceiling levels.

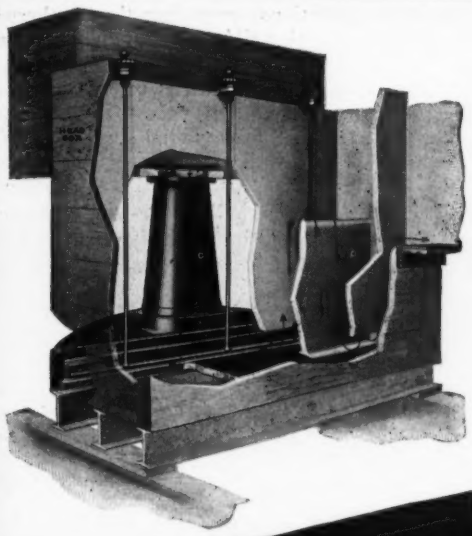
Twine

Demand is good for all grades of twine, and some complaints of poor quality are reported. Quotations are firm and no important changes in demand or prices have been reported at this date.

Cancel Convention Exhibit

W. H. Chamberlain, executive secretary of the National Paper Trade Association states that the annual convention exhibit has been cancelled.

"Once more," says Mr. Chamberlain, "we must advise that owing to the overtaxed hotel situation in this city, the usual exhibit of wrapping paper, paper products, twine and kindred lines, usually held in connection with the annual February convention at the Waldorf, cannot be accommodated and has been cancelled. The convention dates, however, are set for the week of February 19. It is exceedingly difficult to obtain hotel accommodations in New York at the present time and reservations up to capacity are reported far in advance. The Waldorf and other hotels regularly patronized by our members are requesting us to ask that parties located in the Metropolitan area should not make convention reservations."



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HIGH efficiency flow . . . reduced head loss . . . screens at lowest levels will deliver maximum flow . . . increased paper machine speed without raising the screens.

These are the outstanding advantages of the Murray Flow Spreader for Fourdrinier machines, illustrated above. Built to fit any existing machine, it is simple to install for replacement of the old style inefficient piping headers and fittings—a unit of all copper and bronze cast construction for delivering the stock from surge box to the head box. The flow spreader is made the full width of the head box . . . the distributor nozzle is a brass casting arranged with a series of control gates, also the full width of the head box, delivering the fluid over the entire width into a fully open area—a streamlined flow.

Furnished complete separately as units that you can install between the existing surge box and existing head box . . . also furnished with new designed streamlined head boxes as a complete unit to install on your paper machines.

Let us submit design and proposal on flow spreaders, or on complete head boxes with flow spreaders built in. Our engineers will assist you in your modernization program.

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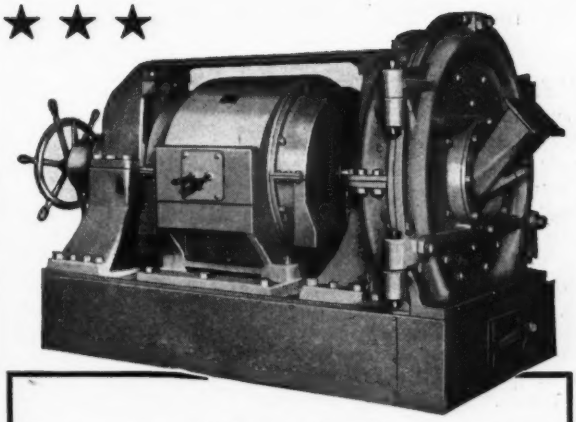

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Beginning at the head box, you get a better slice because fibre knots have been rubbed out without shortening individual fibres. You get a better lay on the wire, a more uniform nip at couch and press rolls, consequently less water, faster drying, less steam and power per ton of paper—more profit through lower cost.

You get a succession of additional benefits from the Type 36-2 Refiner—versatility through simple, accurate control; close clearance of constantly parallel plates with complete freedom from deflection, unrestricted flow of pulp through free inlet; no need for seal at inlet; large, self-aligning anti-friction bearings; accessibility for plate changes, lubrication and adjustments; rugged construction and other features—all of which add up to better product at lower cost.

Many in use throughout the paper industry.

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, October 25, 1944.

BLANC FIXE—The market for blanc fixe is reported stable and unchanged, for the week. Current demand fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER—Current demand is reported good. Supply situation reported satisfactory. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 25 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pounds, f.o.b. shipping point.

CAUSTIC SODA—Supply situation continues tight, with production high and Government demand reported very heavy. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported moderate this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE—Production reported excellent. Demand for all uses heavy; all essential requirements fulfilled. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Higher prices are quoted on some grades of rosin this week: OPA ceiling price on "G" gum rosin is set at $5.79 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $5.75 per 100 pounds in barrels, New York. Seventy per cent gum rosin is currently offered at $6.06 per 100 pounds, f.o.b. works.

SALT CAKE—Demand reported good. Quotations on salt cake continue to remain unchanged. Domestic salt cake is currently quoted at $16 per ton.

SODA ASH—Market requirements for soda ash continue very heavy. Production reported good but manpower delays bagged shipments. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Corn is reported coming into market in relative light volume, and industrial supply situation continues uncertain. Quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHATE OF ALUMINA—Supply situation is reported favorable. Quotations are unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported steady for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract prices at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported moderately active. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	66.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet....	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....	11.25	@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*48.00	"	—
Sgl. Mla. Lt. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards...	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10 @	$46.00	$40.25 @ $47.25
100% Rag	32.20 "	37.75	33.35 " 39.25
85% Rag	.... "	....	29.90 " 35.00
75% Rag	23.00 "	27.00	24.15 " 28.25
65% Rag	.... "	....	22.80 " 27.75
50% Rag	18.70 "	22.75	19.90 " 24.25
25% Rag	16.40 "	20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1..	$10.55 @	$12.75	$11.70 @ $14.25
No. 2..	9.65 "	11.75	10.80 " 13.25
No. 3..	9.20 "	11.25	10.35 " 12.50
No. 4..	8.90 "	10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65 @		$15.50
No. 2 Glossy Coated...	12.40 "		14.00
No. 3 Glossy Coated...	11.60 "		13.25
No. 4 Glossy Coated...	11.15 "		12.75
No. 1 Antique (watermarked)	10.25 "		11.75
No. 2 Offset	9.60 "		11.00
A Grade E. F.....	9.35 "		10.75
A Grade S. & S. C...	9.60 "		11.00
B Grade E. F.	8.85 "		10.25
B Grade S. C.	9.10 "		10.50
C Grade E. F.	8.55 "		9.75
C Grade S. C.	8.80 "		10.00
D Grade E. F.	8.25 "		9.50
D Grade S. & S. C. ..	8.50 "		9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$86.00		
Unbl. Softwood Sulphite.....	74.00		
Bl. Hardwood Sulphite.....	83.50		
Unbl. Hardwood Sulphite.....	71.50		
Bl. Mitscherlich	81.00		
Unbl. Mitscherlich	72.00	@	82.00
N. Bleached Sulphate	86.00		
S. Bleached Sulphate	79.00		
N. Semi-Bleached Sulphate...	82.00		
S. Semi Bleached Sulphate...	75.00		
N. Unbl. Sulphate.....	73.00		
S. Unbl. Sulphate	63.50		
Bl. Soda	72.00		
Unbl. Soda	68.00		
Groundwood	50.00		

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1.....	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.

THIS ⇨ IS THE ENEMY

With one careless thrust of this blade . . . or any other sharp instrument . . . your entire paper mill felt may be ruined. So watch for sharp edges, be careful during washups and changes, inspect storage containers for protruding nails.

Too much scarce wool, too many man hours of labor, too much skill goes into your felts to permit anything but your greatest care. And when questions arise, consult our felt experts. They can help you.

THE ORR FELT & BLANKET CO.
Piqua, Ohio

ORR FELTS

SOLSEAL WATERPROOF TAPE

MEETS ORDNANCE SPECIFICATION AXS-1213

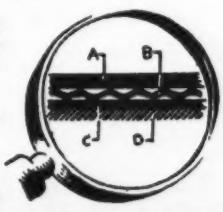
FOR A WATER-RESISTANT GUMMED TAPE

IF YOU are shipping paper or paper products to government depots and warehouses, you are undoubtedly aware of U. S. Ordnance specification AXS-1213 under which the use of water-repellent tapes on certain shipments is now mandatory. SOLSEAL Tape is made expressly to meet these specifications, recommended particularly for the sealing of interior waterproof packages for overseas shipments.

SOLSEAL Tape is applied in the same simple manner as regular tape, using the same type of moistening dispenser. Special Solseal Solvent, used as a moistening agent, is a non-inflammable, non-volatile, mixture of chemicals that will, upon wetting Solseal Tape, cause it to become waterproof. Get in touch with your McLaurin-Jones distributor immediately for samples, specifying weight required.

Use 30/30/30 SOLSEAL TAPE
Where ordinary tape strength for sealing purposes is required.
Tensile Strength—60 lb.
Magnified cross-section 30–30–30
(A)—Kraft—30 lb.
(B)—Layer of Asphalt
(C)—Kraft—30 lb.
(D)—Layer of Solseal Adhesive

Use 60/30/30 SOLSEAL TAPE
Where more than ordinary tape strength for sealing purposes is required.
Tensile strength—74 lb.
Magnified cross-section 60–30–30
(A)—Kraft—60 lb.
(B)—Layer of Asphalt
(C)—Kraft—30 lb.
(D)—Layer of Solseal Adhesive



McLaurin-Jones Co. 301 MacLaurin St., BROOKFIELD, MASS.
Offices: New York • Chicago • Los Angeles

Old Rags

White, No. 1—			
Repacked	*3.80	●	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	●	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	●	4.35
Wool Tares light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	●	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Assorted Counter colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.82½	"	—
White Blank News	1.10	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	●	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons According to grades—	
Washable shredding	.01¾
Fancy Percales	.04¾
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.03
Cottonades	.03¼

Domestic Rags (Old)

White No. 1 — Repacked	3.80	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2 — Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Rooting Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Rooting Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
No. 1 Clean bright—			
Sisal Strings			.04
No. 2 Clean bright—			
Sisal Strings			.03
Sisal Jute	.02½	"	.02¾
Scrap—			
No. 1	3.25	"	3.30
No. 2	1.75	"	1.80
Wool Tares	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.13	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.75	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
New Jute Corrugated Cuttings	1.07½	"	—
No. 1 Mixed Paper	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	●	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.75	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	●	2.50
Sisal Rope No. 1	*4.75		
Sisal Rope No. 2	*4.25		
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	2.75
South American	—	"	3.00

Wool Tares—

Foreign	(nominal)		
Domestic	4.25		
Aust. Wool Pouches	—	"	3.50
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	●	.04½
Fancy Percales	.04¼	"	.05
New White No 1.	.06¼	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06½
Blue Cheviots	.05½	"	.06
Fancy	.02¼	"	—
Washable	.02¼	"	—
Khaki Cuttings	.02¼	"	.03
O. D. Khaki	.03½	"	.03½
Corduroy	.03¼	"	.03½
New Canvas	.06¼	"	.06½
B. V. D. Cuttings	.06¼	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	●	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Rooting Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
*Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	1.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Rooting Bags	1.35	"	—
No. 1 Rooting Bags	1.45	"	—